EX LIBRIS

Hugh Cecil Earl of Lonsdale.

1820.

154 New System of Shoeing Horses: with an account of the various modes practised by different nations; more particularly a comparison between the English and French Methods; and observations on the Diseases of the Feet, connected with Shoeing. By Joseph Goodwin, Veterinary Surgeon to His Majesty, and Member of the Royal College of Surgeons. London. 1820.

8vo. 308 pp. 10 plates. M., $8\frac{1}{2}$ in. by $5\frac{3}{8}$ in.

Dedicated to His Most Excellent Majesty, George IVth.

THIS BOOK RESTORED IN 2019
THROUGH THE SUPPORT OF

CLAIRE REID IN HONOR OF JAMIE
O'ROURKE

NEW SYSTEM

OF

SHOEING HORSES:

WITH

AN ACCOUNT OF THE VARIOUS MODES

PRACTISED BY

DIFFERENT NATIONS;

MORE PARTICULARLY

A COMPARISON BETWEEN THE

ENGLISH AND FRENCH METHODS.

AND OBSERVATIONS

ON THE

DISEASES OF THE FEET,

CONNECTED WITH SHOEING.

By JOSEPH GOODWIN,

VETERINARY SURGEON TO HIS MAJESTY,
AND MEMBER OF THE ROYAL COLLEGE OF SURGEONS.

LONDON:

PRINTED FOR LONGMAN, HURST, REES, ORME, AND BROWN,

PATERNOSTER-ROW;

AND J. PORTER, PALL MALL.

1820.

TO

HIS MOST EXCELLENT MAJESTY

GEORGE THE FOURTH,

THIS WORK,

OF WHICH THE PRINCIPAL MATERIALS HAVE BEEN

COLLECTED FROM PRACTICE

IN HIS MAJESTY'S ROYAL ESTABLISHMENT,

IS,

BY MOST GRACIOUS PERMISSION,

INSCRIBED,

WITH THE HIGHEST SENSE OF DUTY,

BY

HIS MAJESTY'S MOST HUMBLE

AND DEVOTED SERVANT,

JOSEPH GOODWIN.

Carlton Palace,
February, 1820.

CONTENTS.

PRELIMINARY OBSERVATIONS - Page 1

CHAPTER I.

General Observations on the Structure of the Foot 13

CHAPTER II.

Of Perfect Hoofs - - - 18

CHAPTER III.

Of Imperfect Hoofs - - - 24

CHAPTER IV.

Of Contraction - - - 30

CHAPTER V.

Of Thrush - - - 46

CHAPTER VI.

Of Corns - - - - 53

CHAPTER VII.

Of Sand Cracks - - 61

CHAPTER VIII.

Of Pumiced Feet or Convex Soles - Page 66

CHAPTER IX.

Of Soles unnaturally Concave - - 79

CHAPTER X.

Of Founder - - - - 83

CHAPTER XI.

On the Nerve Operation - - 89

CHAPTER XII.

Observations on some of the Tools used by Shoeing Smiths - - - - 104

CHAPTER XIII.

On the ordinary Methods of Shoeing Horses in England - - - - 110

CHAPTER XIV.

Of the Seated Shoe - - - 117

CHAPTER XV.

Of Professor Coleman's System of Shoeing - 122

CHAPTER XVI.

Of Mr. Bracy Clark's System of Shoeing - 143

CHAPTER XVII.

Of the French System - - Page 155

CHAPTER XVIII.

Of the Persian and other Foreign Systems - 164

CHAPTER XIX.

The Author's System - - 169

CHAPTER XX.

On Bar Shoes - - - 188

CHAPTER XXI.

On the Patten Shoe - - - 195

CHAPTER XXII.

On Screw Shoes - - - 199

CHAPER XXIII.

On Grass Shoes, or Tips - - 208

CHAPTER XXIV.

On Shoes with moveable toes - - 211

CHAPTER XXV.

On the Hunting Shoe - - - 21

CHAPTER XXVI.

On the Racing Shoe, or Plate - - 21

CHAPTER XXVII.

On Fullering - - - Page 225

CHAPTER XXVIII.

On Punching - - - - - 228

CHAPTER XXIX.

On Frosting - - - - - 233

CHAPTER XXX.

Of Nails - - - - - 238

CHAPTER XXXI.

On Nailing - - - - 248

CHAPTER XXXII.

Paving Stalls, Gratings, &c. - - 262

CHAPTER XXXIII.

On the Management of Feet in the Stable - 268

CHAPTER XXXIV.

Of the cutting Shoe and Boot - - 274

CHAPTER XXXV.

On Water and Poultice Boots - - 281

CHAPTER XXXVI.

On Shoeing Smiths - - - 292

PRELIMINARY OBSERVATIONS.

As I propose, in the following pages, to attempt an elucidation of an important part of the Veterinary art, the reader will naturally enquire what are my pretensions for addressing the public on this occasion. My claim, I conceive, rests on the best of all foundations — long experience; for I may briefly state, that I have been extensively occupied in attending to the management and diseases of horses of all denominations, both in the army and in private practice, during the last twenty years. With this recommendation I shall feel gratified should my endeavours to do a public service have not been exerted in vain.

But before I proceed to my particular subject, I think it necessary to premise something on the state of the Veterinary profession in this country.

Previously to the establishment of the Veterinary College, little had been done to improve the art in this country. The practice was in the hands of a class of individuals, by no means competent to the purpose, being very generally illiterate men. They consisted of smiths with knowledge sufficient to bend a piece of iron, and to nail it on a horse's foot; and these were considered sufficient qualifications to the title of a farrier, with a full licence to perform operations and prescribe medicines. Receipts were employed by these persons, the value of which were estimated in proportion to their antiquity, and the number of their ingredients. This practice, so general, esta-

blishes the clear fact that the art was then in the greatest possible state of ignorance: though by this no reflection is meant to be cast on a useful class of men; for so long as the country was satisfied with them, it was not to be expected that any substantial improvements in their art would be attempted.

It has been matter of great surprise, that this state of things should have so long continued in a nation, universally admitted to possess the finest and most valuable horses in the world, as is proved by the numbers purchased at very high prices, and sent to every other country.

Thus having shown that the Veterinary art is but a new profession in this country, it ought also to be mentioned, that it commenced under many difficulties. The

success, it has since met with, is chiefly attributable to His Majesty having been graciously pleased to grant commissions to the regiments of cavalry, and more lately by the fostering patronage of the Prince Regent, who has never failed to encourage what is good and useful for the public benefit.

When the improvement of the Veterinary art first began, it was at a period unfortunate for making rapid progress; the source of all communication with the Continent being cut off, deprived us of a free intercourse with veterinary institutions, which had long been established in other countries. The veterinary surgeons of this country were therefore obliged, for many years, to depend on themselves, being destitute of all collateral information. It is true, that our Veterinary Institution commenced under the direction of a foreigner, but he soon

died. The directors of the College, on his death, appointed two teachers for this school of useful knowledge; but they were both educated to the science of human, and not of animal medicine. Mr. Moorcroft, after having visited the schools on the Continent, undertook to direct the practical part of the department; and Mr. Coleman the anatomical and physiological.

This system of education went on but for a short time, as Mr. Moorcroft withdrew from the establishment, and the sole direction and instruction then devolved on the present Professor, who has since made great, and in many instances, successful efforts towards the advancement and progress of veterinary medicine. But having no previous knowledge of the subject, anatomy and analogy were, in course, the great sources for the foundation of his

practice: hence many of the opinions and notions, at first entertained, have since been abandoned as erroneous, and new ones substituted.

In this way have all practical professions ultimately arrived at something like correct conclusions, and it could not be supposed, that the mere circumstance of any gentleman being made professor, who was previously unacquainted with the principles of the Veterinary Art, could fill him instantly with precise ideas on every part of this new science, where practical skill is so essential: therefore a publication under such circumstances would be, at any rate, questionable in its opinions, and it has accordingly proved so; for the plan and principles of shoeing so strongly recommended at that time by the Veterinary College, and so extensively tried, is now scarcely heard of.

It is but justice to acknowledge, that the profession and the public are deeply indebted to the committee of examiners, who, with the exception of the professor, are all teachers, either in human anatomy, physic, surgery, or chymistry, and who have gratuitously opened the doors of their theatres to the veterinary pupils. But as twenty-five years have elapsed since the commencement of the institution, I am one of those who think, that at this period a fair proportion of the most eminent senior veterinary surgeons ought to compose that board; for however eminent those gentlemen may be in their own particular branch, I think no one will contend for their superior competency in practical skill in this profession; and I think also, that the board will be considered more efficient, by adding some of its own members; as it is neither fair nor reasonable, that

questions of practice should be left to the decision of any one person.

The preceding observations will, in some measure, explain my motives for appearing before the public. I am well aware of the importance of the task I have undertaken, and of the difficulties I have to contend with; as the plan and principles of shoeing horses, which I have ventured to recommend, are in direct opposition to the common method employed in England. But before I proceed to any explanation of this new practice, I think it necessary to point out the reasons which led me to adopt it.

Several years ago, when cavalry-officers and others, who had been on the Continent, were going through Carlton House stables, I repeatedly heard them observe, that the proportion of lame horses in France, com-

pared to the number in England, was quite trifling. This induced me to neglect no opportunity of enquiring into the cause of so important a fact: I frequently asked if there was any difference in their method of shoeing, or any other circumstance, which contributed to this desirable object; but I could not acquire any distinct information. However, when the communication between France and this country was opened in 1814, an opportunity presented itself. Two horses were then brought from the King of France's stables, both of which were aged, and had previously undergone several years of hard work. Their feet were very perfect in form, and in good order, and they are so at this time, and have continued so ever since they came to this country, notwithstanding they have done much work. I do not wish to make it appear that a correct notion was to be formed of the French prin-

ciples of shoeing by two examples; but they afforded me an opportunity of observing their method in a general manner. I soon perceived that there was not any similarity whatever in the form of their shoes, or in their principles of shoeing, with the mode practised by the English; I therefore began to suspect that the plan of shoeing horses in France would sufficiently explain, and would eventually prove, the truth of the general observation, that I had continually heard repeated for years, viz. that lame horses were seldom to be seen in that country.

I was most desirous to make a trial of the French system; and having obtained permission for that purpose, I selected some post-horses belonging to the private stables at Carlton House, that could not be kept at work when shod upon the English

principle; it soon appeared that they improved in their feet, and went to work. Others were shod in the same manner with the same success.

Two years elapsed, the new system of shoeing being attended with continued success; and I anxiously availed myself, during this period, of every opportunity to become acquainted with the reasoning of the French veterinarians on this important subject.

I found it consistent with every view I had entertained, and I have now great satisfaction in making it publicly known, that after a trial of the system for several years in this large establishment, consisting of horses used for the different purposes of the road, posting, town-work, and hunting, its beneficial effects are so manifest, that I have no hesitation in pronounc-

ing it to be the best possible practice as yet discovered.

It may perhaps appear presumptuous in me to advocate a method of shoeing without having seen more of its use. If it had originated in a theory of my own, I must have bowed to such an opinion; but as I am only endeavouring to promulgate a system, that has been in practice, more or less, not only among the French, but in almost every part of the world, with the exception of England, for ages past, I feel confident in recommending it to the public.

CHAP. I.

GENERAL OBSERVATIONS ON THE STRUCTURE OF THE FOOT.

A MINUTE detail of the anatomy of the foot of the horse, and of the process of nature for the formation of the hoof, I consider to be unnecessary in this work, as these subjects have been already laid before the public with much ability by preceding writers. But I do not concur with them in many important physiological points, and the reasons for my difference of opinion will be stated hereafter.

From this difference of opinion among the authors upon the subject have arisen so

many various notions as to the best method of protecting the feet of horses when required to work, I shall therefore briefly describe the names by which the different parts of the hoof are distinguished, to facilitate any references in the future part of this work.

The hoof may be considered as a box of horn firmly connected in all its parts, which are each distinguished by particular names.

Beginning at the top of the foot, where the hair of the leg terminates, the hoof first makes its appearance, and this part is called the coronet. The coronet continues as far down the hoof as the inner concave surface, which receives the coronary ring. It then takes the name of crust or wall, which forms the whole external surface of the foot, and is all that can be seen, if a horse

be standing on a flat surface; excepting a small portion of horn at the heel. The crust or wall is subdivided into the quarters, or parts of the crust on each side of the foot, the toe, and the heel.

(See Plate I. fig. 1.)

On taking up the foot (Plate VIII. fig. 1.) a continuation of the horn is seen, which is uneven in its surface, and is united in all its parts, thus completing the box. The crust or wall descends below the sole, and extends nearly all round the foot, forming that part on which a horse rests when standing without shoes. The crust afterwards makes a reflection at both heels, and takes a direction towards the centre of the foot, where both portions of it meet, assuming the form of a V. These two ridges of horn, which are called the bars, or binders, are united to the sole below, and

the frog and sole above. The part, joined to the crust, and extending and also uniting to the bars, is called the sole, and is a principal part of the bottom of the box.

Between the bars there is a convex projecting portion, which begins at the heel and terminates about the centre of the foot, where its point unites with the sole, and on each side with the bars in their whole length; this part is called the frog.

Between each side of the frog and the bars, there are two considerable cavities, usually called the space between the bars and the frog.

On viewing the internal surface of the dead hoof, there are numerous thin horny partitions, which pervade the whole inner surface of the crust, excepting the concave

space, appropriated for the coronary ring: these are called the horny laminæ; they are elastic, and firmly connected with the inner part of the crust; and, in their appearance, are not unlike the gills of a mushroom.

The contents of the hoof in the living animal are highly sensible, being composed of nerves, arteries, veins, ligaments, &c. all of which, from disease, undergo changes in their structure, separately or conjointly.

CHAP. II.

OF PERFECT HOOFS.

[See Plate I. fig. 1., and Plate VIII. fig. 1.]

THE hoofs of horses being intended by nature as a protection to the sensible internal parts, it is necessary that they should be strong, thick, tough, and firmly connected.

A perfect foot has the shape of a cone, except at the heel. The front, which comprises the largest portion of the wall or crust, is the most cone-like, and the quarters are less so. When a horse is standing on a pavement, the foot, at its base or bottom, is much larger than at the top or coronet, and the crust descends from the

coronet to the bottom in a regular slope, at an angle of about 45 degrees in the front.

The hoof should be smooth and even on its surface, strong, tough, and vigorous in its appearance; the heels should be well back, and the nearer they approach to the back part of the frog the better; and the more the quarters and heels approach to a perpendicular position, the more they are calculated to support the weight above. The space appropriated for the frog should be wide and open.

Having described as much of a perfect foot as can be seen when the horse is standing, I proceed to describe the appearances and shape of a perfect hoof, when the foot is taken up.—The first circumstance that deserves attention is the uniform box of horn, which, being divested of all its su-

perfluous or exuberant parts, approaches to the form of a circle.

The words "superfluous parts," may require some explanation. Suppose a horse to have run in the fields until he is four or five years old, and that his feet have never been touched by an instrument, this state of the feet would, by many persons, be called a state of nature, and the foot would therefore be thought perfect; but it ought to be considered like any other production of horn, which has grown into a state of exuberance in some parts, and is worn and broken in others. When the hoof is divested of these exuberances, in the same way as we cut our nails to keep them in a fit state, I consider that the proper time to look at the hoof to observe its natural shape. It will then appear that the base or bottom of the crust descends to the low-

est part of the foot, and projects beyond the sole, and is that part which the horse rests upon. It should therefore be thick, firm, and strong: in its natural state, it is rather thicker at the toe than at the quarters and heels; but the nearer it approaches at these parts to the thickness at the toe, the more it is calculated to stand work. Sometimes it is perceived that the thickness of the crust deviates; the inner quarters being thinner than the outer, and that in some cases, though rarely, this is reversed. As the crust is that part on which the shoe rests, and to which it is nailed, it is very important that it should be perfect in thickness and strength. The bars or binders which I have already mentioned, as being a reflection or continuation of the crust, should be firm and strong, and should have an oblique position in the descent to their union with the bottom of the frog. The

sole should also be firmly and uniformly united with the crust and bars, and should be strong and concave. The frog, which is uneven in its surface, being convex on each side, concave in the centre for about half its length, and then convex to its termination, should be strong, full of horn, prominent and vigorous in its appearance, open in the centre or cleft, and full on its sides and point. The space between the frog and bars should be open, distinct, and clear, and the heels of the crust should come as far back, or nearly so, as the heel of the frog.

Horses' hoofs are of different colours, black, white, and a variety of gradations in shade; in many instances there is a mixture of colours, which not unfrequently resemble the variegations of a piece of marble. It is generally remarked that white

hoofs are not so durable as those which are dark coloured, and that they are more prone to disease. I have reason to think there is some foundation for the observation.

As it is the custom in this country to begin to shoe horses from one year and a half to two years old, an age when the hoofs, like the other parts of the body, have not arrived at maturity, it is not, therefore, a matter of surprise that very few feet are to be met with, which can be considered even tolerably perfect.

CHAP. III.

OF IMPERFECT HOOFS.

I SHALL first consider those imperfections in the hoofs of horses, which are not the effect of any particular system of shoeing, but which occur from natural deformity.

Weak feet.—(See Plate VIII. fig. 4.) The natural imperfections of most frequent occurrence, are those which are denominated "weak feet," and the term is not inappropriate, as in such feet there is not horn enough to answer the purpose of wear and tear; the hoof is thin, and not sufficiently strong to support the weight of the animal; and when a horse is in action it proves insufficient for the defence of the internal

sensible parts. Feet of this description are frequently large, flat, and thin, though there are also some which are very thin, but not out of proportion in size: both kinds are uniformly concave on the front part of the crust, and curl up at the toe in proportion to the extent of the defect. (See Plate VIII. fig. 4.) It is equally observable, that the crust, in feet of this description, is uneven on the surface, being frequently indented, wrinkled, and having a ring-like appearance. They generally have a small coronet, the diameter of which is not in proportion to the base or bottom of the foot, which is in many cases unusually broad, flat, thin, and for the most part circular.

Much has been said by Mr. Coleman about the circular form of the hoof being an unerring principle of nature, and when so formed, it is by him considered as a test

of its perfection ; but as the class of hoofs which I have here described is numerous, and very generally circular, I contend that a circular form furnishes no proof of the perfection of the foot.

It will also be observed, that the crust at the bottom is thin and weak, the sole also is thin and flat, the bars or binders scarcely appearing, and the heels are weak and feeble, and in many instances almost wanting. In others they are indented and distorted, instead of forming two distinct pillars of horn, as is observable in the perfect hoof.

The frogs of hoofs of this kind are generally the parts best protected by horn; but this is not always the case.

Horses with hoofs thus formed are nu-

merous, and it has been said that this imperfection is principally confined to dray-horses; but I have observed that weak feet are met with as frequently in every other class of horses, with the exception of ponies, among whom such a form is very rare.

Small feet.—The next imperfection which I think it necessary to mention, is where the foot is altogether too small, but without having any particular appearance in the form. It is not unfrequent to see large horses, but chiefly among those which are thorough-bred, with small feet. The base of the feet of these horses not being broad enough to support the super-incumbent weight, they are consequently insecure on their legs, and soon break down.

Large feet. — There is likewise a class of horses with feet of a form the reverse of

that last described, having no peculiar malformation, but being too large and unwieldy. When such horses are required to work, the weight of the foot has a manifest effect on their action, rendering it slow and clumsy.

Some Veterinarians have stated, that horses bred in low and marshy situations, have uniformly weak, thin, and flat feet; the truth of this has not, however, been proved by my own observation. A continued state of moisture, with so much weight on the feet of horses, certainly disposes them to flatness; but I have not remarked it to be a maxim, that less horn is produced in these situations than in others.

Having considered the natural imperfections of horses' feet, I shall next give an

account of those defects and diseases which are produced by an improper method of shoeing and treatment of the feet. These are contractions, corns, sand-cracks, thrushes, concave and convex soles, founder, &c.

After having entered into the consideration of these diseases, I shall describe the instruments principally in use by shoeing smiths, and then enumerate the causes that produce those diseases, which will lead to a description of the present English method of shoeing.

CHAP. IV.

OF CONTRACTION.

As the hoofs of horses are elastic, it is manifest they must be susceptible of changes in their natural form and appearances. Contraction is every where to be observed among horses in this country, and it is a rare occurrence to meet with feet, that have not partaken more or less of this prevailing disease. (See Plate VIII. fig. 2.)

This state of the foot is observed in a variety of forms; sometimes it is perceived that both heels are approaching near together, and that the space appropriated for the frog, and the frog itself, is diminishing in its diameter; the frog also becomes ragged, dwindles away, and has little or no

horn; the quarters and heels at the same time lose their shape, and finally, the foot becomes larger round the coronet than at the base. In some cases it is seen that one heel is inclined to contract more than the other, and this happens more frequently with the inner quarter and heel than with the outer.

In other cases contraction begins at the coronet, and as the hoofs grow down, there appear many deep grooves round the foot; the soles are generally thick, and the quarters and heels high;—the term, high, is rather an improper one, but it originates in the horse being raised in consequence of the descent of the heels below the frog.

As the sides or quarters come nearer together, the foot increases in length at the toe, and frequently assumes the appearance

of a mule's foot. — Contracted hoofs are generally dry and hot, which may be ascertained by comparing with the hand the heat of a contracted hoof with the heat of a perfect one. Let a contracted hoof be immersed in water, and also another which is not contracted ; it will then be seen that the contracted foot dries much sooner than the other.

Horses that have an abundance of horn are more prone to this disease than those where horn is in a less proportion ; but it occasionally affects all denominations of hoofs.

On the first appearance of this disease, a horse is continually changing the position of his feet in the stable ; thus evincing more or less internal inflammation, and on pressing the soles with pincers he flinches. He

first advances one leg and then the other, if the disease be in both feet; but if one only be affected, it is invariably that which is stretched forward.

When required to work, he sweats much sooner than a sound horse, he goes near the ground, is afraid to lift his feet up, appears foot-sore, tender, and goes very unsafely; he frequently trips, blunders, and ultimately falls. In this manner the disease goes on till the horse becomes permanently lame.

If the contraction be in one foot, that soon becomes smaller than the other; and if in both, they both diminish in size.

It is distressing to witness the action of horses in this state; the pain they endure induces them to throw as much weight on

their haunches as they can in order to relieve their fore-feet; they consequently stretch out their fore legs, bend their hocks, and lower their croups nearer to the ground. When in the stable they continually lie down, and will scarcely get up to feed; in this deplorable state, and it is lamentable to know that it is frequent, the animal is doomed to the slaughter-house.

In the early stage of this disease, various attempts have been made to relieve it, as drawing the soles, which is a cruel and barbarous operation, and often has a tendency to aggravate instead of to mitigate the symptoms; blistering and firing round the coronet, removing the contracted parts, grooving with a drawing knife in various directions, and turning out into marshy places until the hoofs are grown down again, and a variety of other expedients.

In some instances, when taken up from grass, the feet appear better, and the horse again returns to work; but in most cases this is of short duration, and then, if in the country, he is sold for a stage-coach, or for post work; or if in London he is sent to a repository, where he is sold for a stage or a hackney coach, and in this way he lingers out a life of pain.

It is not unfrequently seen, that this disease takes place at an early age, and produces lameness; on the other hand we occasionally observe an old horse with his feet contracted, and otherwise out of shape, who is nevertheless very sound, but in the majority of cases, lameness takes place at the commencement of the disease.

This disease is commonly known by the term groggy, founder, &c., and when the

hoofs are not much deformed, it is called chest founder, and it is generally considered to be seated in the chest.

The hind-feet of horses are not liable to this disease, or, perhaps, speaking more properly, they do not suffer from the effects of it: we occasionally see the hind-feet of a bad form, but I never yet saw a horse labour under any permanent lameness in the hind-feet, similar to what has been described respecting the fore-feet.

There are several causes which contribute to bring on contraction; but there is no one which has come within my observation that is so clearly manifest as the mechanical effects of the present modes of shoeing.

If we consider that the hoofs of horses are elastic and yielding, and that iron is a

solid unyielding body, we may readily conceive when an elastic body is bound on, or nailed to an inelastic one, if there be much action or motion, or much weight to support, that the yielding body will give way, and consequently that the horn of the foot must be continually undergoing a change in its form, which I contend is occasioned by the shape of the English shoe now in common use. Having stated that the foot surface of the shoe is invariably a plane inclining from the outer to the inner edge, and that the ground surface is convex, and also that a piece of solid iron of the form described is nailed on to the hoof, it necessarily follows, as the horse treads on the shoe which is convex on the ground surface, that the whole weight must be supported on an edge, and by the nails and clinches. Thus the weight of the animal is continually squeezing the sides of the hoofs together;

and all the horn, at the quarters and heels behind the last nails, has no power to prevent the weight above from pressing them down the inclined plane.

To exemplify this idea, suppose a horse's foot to be put into the mouth of an iron box the size of the foot, and of a conical shape, and that it is pressed by a heavy weight; the iron box being of an unyielding substance, and the hoof elastic, it must, by degrees, assume the form of a cone. Now this is precisely the principle of English shoeing, and it is evident that the base, or bottom of the foot, is gradually made less and less, and becomes variously distorted in its form.

Some are of opinion, that if horses were shod by the worst of smiths, and were not allowed to come into a stable, but were kept

at grass, that their feet would not contract or undergo any change in form, but would remain sound. Unless these horses were kept at regular work on pavements or turnpike roads, no fair conclusion could be made from such an experiment; it is probable, however, that lameness might thus be diminished in the same proportion as the feet are injured by confinement in the stable; but still the animal would be subject to all the bad effects of an ill-formed shoe.

Another cause of contraction is found in the heat of stables, and more particularly in the litter being allowed to remain too long in the stalls. The ordinary custom of stablemen is to remove the wet and heated part of the litter from the stalls twice a week, but in many instances only once, which, being soaked in urine and dung, soon ferments and forms a complete hot-

bed. This has a powerful effect on the hoofs of horses ; and the contrast of a state of nature, and of a bed so heated, must be very obvious.

There is also another cause which materially contributes to the production of this disease, which is the bad mode of paving the stalls of stables so much higher before than behind. When stables are constructed, this circumstance is too frequently left to the discretion of architects. It must be evident, that in stalls paved in this usual manner, the weight of the animal is thrown very unequally on the fore legs and feet, with the toes up much above the heels ; the horse being compelled to stand in this strained position, his weight is irregularly distributed, and the bad effects are soon discovered, not only in the tendons and ligaments, but even in the feet themselves.

Much has been said about paring the frogs and cutting out the bars of the hoof, as having a powerful effect in producing contraction, and strong injunctions have been given, that they should not be touched by any instrument. It has not, however, come within my observation, that if the frogs and bars are pared with discretion, that any tendency to produce contraction is occasioned by it; on the contrary, I consider it to be necessary.

Contraction appears to me, in some instances, to be a cause of inflammation, and in others to be an effect. In the first instance this is demonstrated by a manifest alteration in the form of the foot previous to lameness; in the latter instance, lameness precedes, for some time, any change in the form or appearance in the hoof.

It is the opinion of Mr. Coleman, that as heavy dray and cart horses are not so liable to contraction, as those of other denominations, that weight and pressure on the frogs and feet are a specific against it ; but when it is considered, that these horses are mostly used in a very slow pace, and that their action necessarily employs the toe in a much greater degree than the heel, the circumstance is, I think, sufficiently explained ; and I have no doubt, if dray-horses were subjected to the same work and treatment in their feet, as those are where the defect is most frequent, that they would be equally liable to contraction and all its consequences.

And when it is also considered that small ponies scarcely ever suffer from contraction, I do not think Mr. Coleman's reasoning on the effect of great weight on

the fore-feet in preventing this disease, can be easily admitted.

Another cause of contraction may be added, which is the great concussion the feet receive when going fast over pavement or gravelled roads; this inclines them to inflammation; and contraction, in these cases, must be one of the consequences.

Contracted feet, when dissected, exhibit a variety of diseased appearances: in some instances considerable ossifications and anchylosis of the joints; and in others, the bones within the hoofs have lost their solidity, and have become spongy from the absorption occasioned by the great pressure from the contracted horn.

See Plate VIII. fig. 6. which exemplifies this more clearly.

I have before observed, that various expedients have been resorted to for the relief of contraction and its effects; but I consider it of much greater moment to suggest a method of shoeing calculated to counteract so prevailing and so destructive a disease; and I trust I shall not be considered too sanguine in conceiving, that after a long perseverance I have arrived at something like such a result.

With regard to the treatment of this disease, on the first appearance of contraction, bleeding both generally and locally to counteract inflammation ought to be employed, and the veins which ramify over the cartilages of the coffin-bone will afford a plentiful local evacuation; purging, spare feeding, the abstraction of heat by the application of moisture, and the plan of shoeing subsequently recommended, appear to

me calculated in some instances to cure this disease, and in most cases to relieve and to mitigate the symptoms.

CHAP. V.

OF THRUSH.

The Thrush, a very common disease, makes its appearance in the cleft or centre of the frog. I have already stated, that a sound frog is full of horn, and is firmly united in all its parts; but on the appearance of a thrush it is separated in the cleft, making a complete division of the horn, and penetrating through its whole substance to the sensible frog (which is the seat of this disease), where its depth is terminated. Inflammation and suppuration take place in the sensible frog, and a discharge of fœtid matter, more or less, according to the state of the disease, issues through the division of the horn in the frog. This division often

extends as far back as the hair of the heels, but seldom further forwards than the cleft of the frog.

The thrush is found in all horses: sometimes in one foot only, on other occasions in both fore feet; though the disease is more frequent in the hind than in the fore feet. If it be allowed to continue long, the frog begins to diminish in size; it grows ragged and uneven on its surface; it loses the tough and elastic property of the sound frog, and becomes dry, hard, and brittle; eventually little or no horn is produced, and the whole frog is a mass of filth and disease. As the disease advances, the heels and quarters close in nearer and nearer together, and the space which nature appropriated for the frog becomes nearly obliterated.

Thrushes appear principally to arise from two causes, viz. the effects of the present mode of shoeing, or continued exposure to moisture.

In some cases a thrush produces lameness, but most frequently it is unaccompanied by it. This circumstance has produced a great variety of opinions as to the soundness of horses in this disease; and it has long been disputed, whether the horse is to be considered sound or unsound. There are certainly a great number of horses with thrushes, where the hoofs have not undergone any material change in their form, that I should not hesitate to pronounce sound; but if a thrush be accompanied by a change in the form of the foot, I should pronounce the horse to be unsound.

Any plan of shoeing which is calculated

to bring on contraction, is the most likely to cause thrushes. It has been insisted upon by modern authors, that a principal cause of thrush is the constant practice that smiths adopt of paring the frogs previously to shoeing. This, like most things carried to an extreme, is, no doubt, injurious; but if it be done with judgment and discretion, I consider it a necessary and useful practice. For as the foot is continually growing, the exterior parts, in time, become dead, and separate from the horn growing underneath; if, therefore, these exuberant and extraneous parts be not occasionally removed, a collection of dirt and filth is found between the growing and the dead horn, which, if suffered to continue, frequently terminates in a thrush. But if these extraneous parts are removed with judgment, I have always found that the practice is beneficial.

There is one unerring criterion for the smith's direction in the performance of this operation. When the dead horn is removed from the frog, he will invariably find a whitish, mealy, and crumbly appearance, where the growing horn separates from that which is dead; all, therefore, that the smith has to attend to is to pass through this crumbly or mealy appearance, and to show the face of the growing horn; but on no occasion to remove it.

The cleft of frogs, or the seat of thrushes requires this attention perhaps more than any other part of it: the operation cannot be effected with any accuracy with the smith's sole-knife; it requires a smaller one, with a larger turn, which is better adapted to clear out the cleft and the sides of the frog. (See Plate VI. fig. 3.).

If there is much discharge, a few dressings in the cleft with a little Ægyptiacum, or tincture of myrrh, and a small proportion of vitriolic acid will be useful. Afterwards a piece of tow saturated with a dressing of equal quantities of tar and hog's lard may be put into the cleft daily.

When horses have been long at grass, or kept in wet places without due attention to their feet, thrushes are often the consequence. In these cases it will be necessary to remove all the ragged parts of the frog, and to apply the dressing before mentioned, which in most instances will succeed. In all cases great attention to cleanliness is necessary.

The cause of thrushes, in the hind-feet of horses which are kept in stables, is the

continued application of moisture from dung and urine.

It is a general observation, that it is hazardous to stop a thrush; for by so doing it will affect the eyes. If the disease has existed long, it may be advisable to bleed and physic, as a continued drain from any source requires some precaution when stopped.

Neglected thrushes sometimes terminate in canker; but that is a disease which I do not consider as strictly connected with those which are occasioned by the present system of shoeing.

CHAP. VI.

OF CORNS.

Corns are a very frequent disease, and common to all horses; but those accustomed to slow work are less liable to it than any other class. The hind-feet are not subject to this disease, though on some occasions, a very trifling appearance of a corn shows itself in them; but cases of this kind are very rare, and I have never seen the bad effects produced by corns in the hind-feet, which usually attend that disease in the fore-feet.

Corns generally appear in the inner heels of the fore-feet, at the angle between the bars and the crust; and they seldom occur on the outside heels.

On removing the superfluous horn, corns show themselves by a reddish appearance of the horn in the part before named, and if a little more horn be taken away, they will be seen more distinctly, resembling a part bruised and full of blood, which has made its way into the pores of the horn. This appearance sometimes predominates in the direction of the bars, and sometimes between the crust and the sole, taking the direction of the laminæ.

Corns, like thrushes, are not always accompanied by lameness, though that is a very frequent and troublesome consequence of them.

It is also in this disease a disputed point, whether a horse is to be considered sound or unsound. Corns frequently appear at a very early age, and in some instances be-

fore the animal has been shod ; if, therefore, every horse was deemed unsound that has an appearance of a corn, there would be very few that could be called sound. I consider this in a similar light to thrushes ; if there be only the appearance of a corn, without any material change in the form of the hoof, or previous lameness, I should not hesitate to pronounce him to be sound ; but on the contrary, if there be a difference in the form of the foot, and if he expresses soreness when pressed by a pair of pincers, I should then consider him to be unsound. It may be opposed to this, that when a disease has shown itself, the horse is no longer to be considered sound ; but I think a necessary distinction may be made where there is only a trifling appearance of disease, without any ill effects, and when this appearance often gradually disappears.

When lameness proceeds from corns, it on some occasions comes on suddenly, but generally by degrees. When a horse is lame, and there is no reason to suspect it to be in any part above the foot, on the shoe being removed, it is often found to be occasioned by corns, and this the drawing knife and pincers soon ascertain.

Corns appear to be the effect produced either by the shoe, or by the horn taking a wrong direction in its growth. The consequence in both cases is the same; but the proportion of those which arise from the former cause, are infinitely more numerous than the latter, viz. an increased pressure from the shoe on the internal sensible heel, which causes an extravasation of blood into the pores of the horn; and if the pressure is continued, and there is more blood extravasated than can be readily taken into

the circulation again by the absorbent vessels, inflammation and suppuration generally succeed.

In some instances where corns have not been suspected to exist, and the horse has been lame for some time, it is found that matter has formed under the horn, pervading the sole and frog. This matter often makes its way up the laminæ, and ultimately breaks out between the hair and hoof, and terminates in an unhealthy sinus, or in what is termed a quittor.

It has been contended, that the only cause of corns, is from the heel of the shoe lying in close contact with that part of the sole which is between the bar and the crust; and that if a necessary portion of horn was removed at every shoeing, no such effect could occur; but, however

cautiously this operation may be performed, if the shoe itself is of such a form as may produce a morbid change in the form of the hoof, it will be found that corns, with all their troublesome consequences, will continually take place. And I have no doubt, if a plan of shoeing can be suggested which is calculated not to bring on this disease, that it will be considered of far greater importance than any remedy which may be suggested for its cure.

To remove any urgent symptoms, if the horse is very lame, most likely suppuration will have taken place, and it will be proper to pare the horn as closely as the sensible parts will allow, that the matter may escape. Fomentations and poultices will be necessary, with bleeding and physic, and a spare diet; and as the inflammation abates, and

the new horn grows up, any simple dressing may be applied.

It is sometimes a practice on the appearance of a corn, to apply caustic applications, and even the actual cautery; but it is obvious, that such a mode can only tend to aggravate instead of to alleviate the symptoms. If it has been necessary to remove much horn, the animal should be at rest, either in a loose place, or be turned out to grass, till the horn be regenerated. But, on some occasions, where horses are required to work before the new horn is grown down again, bar shoes will be of great use.

There are a number of cases where the inflammation does not terminate in suppuration, and where it has not been requisite to remove much of the crust: these

symptoms are in general removable by the ordinary treatment of inflammation, both general and local.

In all cases of lameness rest in a loose place is necessary. .

CHAP. VII.

OF SAND CRACKS.

The Sand Crack is a longitudinal slit, or division of the fibres of the crust, which commences at the coronet, and extends more or less down the foot in the direction of the fibres, according to the previous state of the hoof; on its first appearance, it is seldom lower than the middle of the foot, and it is generally accompanied by a trifling discharge of blood, which may be perceived oozing through the crack.

The inside quarters of the fore-feet are most frequently the seat of this disease: it is seldom found on the outside quarters, and is rarely to be met with in the hind-feet.

All horses are liable to this disease, though some are more so than others. Those of the heavy kind, employed in slow work, are least to it; and the same reasons will apply here, as in contraction; for as this class of horses is generally used in slow draught, the heels are but little used; neither are they subject to a high temperature in the stable, nor accustomed to stand on hot litter.

This disease also is not always, though it is frequently, attended by lameness.

The cause generally arises from an improper method of shoeing; for that mode, which alters the natural form of the hoof, combined with the absence of moisture and the heat of the stables and litter, by destroying the tough elastic property of the

hoof, renders it consequently more liable to this disease.

But it sometimes occurs among those that are never shod; for I have observed it among brood-mares without shoes; with them it generally happens in dry summer months.

If this disease be not radically removed, the horn will not re-unite; but will continue to grow down with the split still existing. The part separated is called a false quarter.

To effect a cure it will be necessary to cauterize the hoof at the coronet with a common firing iron, in a transverse direction, making a line across the crack of two inches in length, about an inch below the termination of the skin, the edge of the iron should pass through the horn to the

sensible parts, and the surface of the coronary ring should be lightly cauterized with the flat side of the iron, to cause inflammation. The iron should also be applied at the lower end of the crack to prevent it extending further down.

A bar shoe should be employed, that the quarter and heel may not come in contact with the shoe, and to leave the diseased parts at rest.

This operation will of course produce considerable inflammation; the usual remedies of bleeding, physic, fomentations, poultices and a spare diet will then be necessary. When the inflammation is abated, the new horn, connected in its fibres, will be seen growing from the coronet, and the hoof will gradually become sound; a run at grass, or a loose place,

will be beneficial until the new horn is completely grown; and when the horse is again shod for work, a different plan of shoeing, and keeping the foot cool and moist, are remedies which will naturally suggest themselves to prevent a recurrence of the disease.

CHAP. VIII.

OF PUMICED FEET OR CONVEX SOLES.

[Plate VIII. Fig. 3.]

A PUMICED foot is that in which the sole descends below the crust; if the horse stands without shoes, the sole is the part which will come in contact with the ground instead of the crust; which, as I have stated when treating of the perfect hoof, should be the resting surface.

This disease is invariably accompanied with a deformity of the crust in the front of the foot; it loses the full and prominent appearance observable in a sound hoof, becomes hollow and wrinkled, and turns up at the toe. It is a very common disease, and all horses are liable to it; but it pre-

vails principally among those which have flat, circular, broad feet.

There are, however, cases of this disease in feet, where there is an abundance of horn.

As the disease goes on, the sole sinks lower and lower, the wrinkled hollow appearance in the front increases, and the toe curls more up, till at last the whole hoof becomes completely distorted.

This disease, like some others, is not always accompanied by lameness. Horses with this sort of feet, when in action throw the greater part of their weight on the heels, consequently they seldom or ever trip, but are continually dropping and blundering.

The principal cause of this disease is a defective production of horn in the sole, crust, and laminæ; the frog and heels, generally are much stronger than the other parts; it rarely occurs until the horse has been shod some time, and I think it is much accelerated by the mode of shoeing now in practice.

In horses where the secretion of horn is insufficient to meet all the purposes required, (and my observations lead me to estimate their number at about one half,) it is found, even at an early age, after having been shod a few times only; for as the crust and laminæ are thin and weak, they are unequal to support the weight, which nature intended should, from the peculiar structure of the horny and sensible laminæ, be chiefly borne by them. This does not wholly arise from a defect of

Nature, for Nature did not intend that the animal should be shod, kept in hot stables, or go a great pace upon hard roads. As the disease increases, the coffin bone and the internal contents of the hoof, sink and bear down upon the horny sole, which, being also thin and weak, gives way, soon losing its concave appearance, and becomes convex. It is not unfrequent also, to observe a considerable separation between the sole and the crust, which in some cases extends upward, towards the coronet ; the heels also take an oblique, shelving direction forward.

When a horse is in a state of nature, and on a yielding soil, the crust penetrates the earth, and a considerable portion of weight is consequently borne on the frog and sole, which shows that the crust and laminæ in this state have not so much to support as when the animal is shod. There is con-

sequently, when shod, a double task imposed upon the crust and laminæ; when this is considered, together with the weak state of the horn, we are not much at a loss to account for the numerous feet we observe unequal to support the animal, and the deplorable effects arising from such a state of disease.

In the early stage, the crust which is in contact with the shoe is unequal to support the weight of the animal, it gives way, bends, and generally curls inwards at the quarters and heels, and not unfrequently rests on the sole, thereby causing lameness.

When the feet are not properly pared, but are allowed to spread (which they are generally disposed to do), they become large, broad and flat at the bottom; and unwieldy and clumsy when in action.

Horses of this description, if going over pavement, may generally be distinguished by the hollow clattering noise produced by the broad heavy shoes they generally wear.

I cannot omit this opportunity to mention the absurd instructions which on many occasions I have heard given to smiths, not to remove a particle of horn from the foot, because, it is said, Nature never made any thing in vain. Those who give these orders must forget, that as the foot is covered with iron, and is continually growing, that no horn is removed, except by the smith, and that if it were allowed to remain, it would soon grow into a variety of distorted forms.

Another cause, which sometimes produces this disease, and sometimes occurs in the

hind feet also, is "fever in the feet." This is by no means so common a cause as those before described, but it is not an unfrequent one.

When the disease takes place from this cause, it produces the most distressing effects, and in some instances it proceeds till the hoofs separate from the sensible parts and come off. On inspection after death, the horny and sensible laminæ, the coffin bone, and all the contiguous parts are found to be in a high state of disease.

To relieve pumiced feet, the first thing necessary, if it proceeds from a weak, feeble state of the horn, is to assist the crust and laminæ in supporting the superincumbent weight by taking off the shoes and allowing the sole and frog to come in contact with the ground; thus in a great measure

the weight will be taken off the crust and laminæ, and they will be in a comparative state of rest. All the superfluous horn should be removed, and if the case be severe, it is probable that the foot will be too sore and tender at first for the animal to stand on a hard flat surface without shoes; he should therefore have a plentiful litter of straw in a loose place, and the whole surface of the foot should be rubbed daily with tar and lard ointment.

If this plan of treatment be adopted, it will soon be observed that the prominent parts lessen in convexity, and an increased growth of horn at the coronet takes place. The crust and sole should be kept pared, so as to allow the foot to bear on the convex parts, thereby easing the laminæ and crust, and affording them sufficient rest to regain their usual strength.

of the foot, and the bottom of it is also greatly defended.

There are many instances where horses have done their work well for years with bar shoes, and on trying if they would work in plain shoes, the result has invariably terminated in re-applying the bar shoes; much, however, depends on the manner in which bar shoes are put on, and I refer the reader to the chapter on that subject.

As many horses are compelled to work when this disease has made considerable progress, a broad heavy hollow shoe is applied, and some smiths, who perhaps work better than others, put on what they term a boxed shoe, which has a bar, and on the foot side a seat place for the crust to rest on; on the ground surface the nail holes are set down below the raised or hollow

part of the shoe; by this means the convex sole is covered and protected from blows, or the pressure of stones and gravel, &c. and if horses are shod when in this state, this is certainly the best plan; but when the soles become so convex as to require expedients of this kind, a still better mode is to put the horse out of work for a time, and to employ the treatment here recommended, till he is able to wear flat shoes.

The application of a very narrow and thick shoe, for feet of this description, has been recommended by Mr. White of Exeter; but I think few persons would venture to ride a horse with thin soles, if shod in this way, on a road exposed to flints and stones; perhaps over pavement a horse with such a shoe might go better, make

less noise, and be more secure on his legs, as he would not be so liable to slip or slide as he would be with the large flat shoe.

CHAP. IX.

OF SOLES UNNATURALLY CONCAVE.

As the perfect foot has been described with a concave sole, I here refer only to those cases where the concavity is such as to be considered a disease. Instances of this kind are by no means so numerous as those where the feet are too convex, at the same time it is not an unfrequent disease.

It may readily be conceived that this disease will prevail among those horses which have an abundance of thick, strong, and firm horn. It never occurs in the hind feet.

In contracted feet the soles generally become too concave as the contraction in-

creases, but that degree of concavity belongs particularly to cases of contraction, and is quite a distinct disease from that which I am about to describe.

It occurs in those feet, where, if a person had no previous knowledge of the animal being lame, he would think it, on a casual view, a perfect, strong, and firm foot; but on knowing the animal to be lame, and observing no external cause, on a closer inspection, and by paring the foot, the cause of the lameness will soon be perceived to arise from an increased concavity of the sole, which will be found to be two or three times the thickness of an ordinary sole, and when thinned to a moderate degree, the bottom of the foot assumes the appearance of a hollow conical dish.

It not unfrequently occurs at an early

age, as I have seen many instances of it at four years old; and it most generally occurs in hoofs of a circular form.

The symptoms of lameness in this disease very much resemble those of contraction; and the same expedients for the cure of it have often been resorted to, with no better success. This is also called groggy founder, &c. The immediate cause of lameness arises from the horny sole losing its elasticity, and pressing the sensible sole against the coffin bone; so that the highly sensible sole becomes pinched and squeezed between two hard bodies, which produces great inflammation and pain every time the horse sets the foot to the ground. The predisposing causes are a superabundant production of horn, and the too prevailing stable-practice of standing on hot litter in an ill paved stall without any stopping. Thus the horn becomes dry, hard, and un-

yielding; and if an animal with this description of foot belongs to a gentleman, who directs his smith not to remove any horn, the disease will rapidly increase.

The most likely means to obtain relief are the expedients used in inflammation, keeping the feet cool and moist; and that these remedies may have a better effect, the soles should be pared very thin once a fortnight, and such shoes applied as are most likely to keep the foot expanded. When the disease has not existed too long, I have seen many cases cured altogether, but it is a troublesome disease to contend with, and the horses generally become fit only for slow draught.

If the causes which have been named, were avoided when young horses first come into stables, I am quite satisfied that the disease would rarely occur.

CHAP. X.

OF FOUNDER.

FOUNDER is a term often made use of to express different diseases of the foot, and is generally applied in those cases where the cause is not very evident. But there is one disease which more particularly comes under this denomination than any hitherto described.

When a horse has been lame for some time without any apparent cause, this disease is then generally supposed to exist. It prevails among all horses, and never occurs in the hind-feet.

I cannot give a better illustration of it than by relating the following case, which

occurred in a very celebrated hunter. When I saw the horse, he had then been lame two or three years, and it had been supposed that he was merely tender or sore from some slight inflammation; but in spite of all the remedies that were adopted, the disease increased progressively until he became excessively lame, exhibiting all the distressing symptoms observed in severe cases of contraction. Various opinions had been formed as to the seat of the disease; as almost every part of the fore-legs, shoulders, and feet, bore the marks of a variety of operations which had been performed; firing, blistering, rowelling, &c. After having minutely examined into the nature of the case, my opinion led me to state that there was no prospect of relief, and that, notwithstanding the hoofs had every appearance of perfection, the

cause of lameness would be discovered, on dissection, to exist in the foot.

The gentleman, to whom the horse belonged, immediately directed that he might be destroyed, and after death sent me the feet for dissection. There was no reason whatever to believe, that any change of the form or structure of the horn was the cause of the lameness; but on prosecuting the dissection, I found that a considerable degree of ossification had taken place in the large flexor tendon, which passes over the navicular bone; adhesions also between the bone and the tendon; the articular cartilages very much ulcerated, and that the body of the bone had become carious. The disease in both feet was very nearly similar.

As this disease occurs in feet where no change of form has taken place to warrant

any idea of its arising from such a cause, it can only be attributed to the violent concussions which the feet are subject to when in strong action, together with the heat of stables and standing on hot litter. These in the first instance produce inflammation, and as the animal is still exposed to the same causes, the inflammation goes on, and sometimes terminates in a complete anchylosis of the joints of the foot; if the inflammation be not soon arrested, its effects are generally such as to render the animal almost useless.

If this disease be suspected to exist, the animal should be kept in a perfect state of rest, by turning him into a loose place, taking his shoes off. Bleeding, both general and local, purging, and keeping the feet in water-boots, thinning the soles frequently,

are remedies likely to subdue the inflammation.

It is very manifest, that any plan of shoeing which is calculated to counteract the effect of concussion must be desirable; and I am quite satisfied from much experience, that the plan hereafter explained possesses this property in a great degree.

It may not be unworthy of remark, that much credit has been given to Mr. Turner, of Croydon, for having discovered the seat of this disease, which has been called the "Navicular disease." Though the case here mentioned was dissected before Mr. Turner became a pupil at the Veterinary College, much merit, nevertheless, is due to him for his assiduity and attention to this disease, and for having pointed it out as the general cause of this kind of lameness; for although

it might have been previously known to exist in particular cases, it was not understood to be the general cause before Mr. Turner investigated the subject.

CHAP. XI.

ON THE NERVE OPERATION.

HAVING treated on some of the most important diseases of the feet of horses, which arise from the various modes of shoeing now in use, as well as from other causes, and having also pointed out the most reasonable means of averting those diseases, as well as for their relief, I shall hereafter describe the different plans of shoeing which have produced them. But as I have, in the preceding part of this work, shown that there are numerous cases of lameness where no rational hope can be entertained of obtaining relief from any method of treatment hitherto known or adopted, in this or any other country, and a remedy having been discovered for the

relief of cases of this kind, it may, I think, fairly be considered as an era in the Veterinary Art. In cases of lameness, hitherto considered as admitting of no relief, viz. all those permanent diseases of the feet which have been so frequently adverted to, it has been proposed by Mr. Sewell of the Veterinary College, to divide, or rather to amputate a part of the nerves which go to the foot. This operation is, on some occasions, performed below the fetlock joint on both sides, and on other occasions above the joint. The success, that has attended this novel and great discovery, most decidedly claims, not only the praise of every professional man, but of the public at large.

After a number of successful cases resulting from this operation, there were persons that attempted to take away the merit of the discovery from Mr. Sewell, by

stating that Mr. Moorcroft had performed the operation twenty years ago. Admitting that as fact, what does it shew? That no beneficial result originated from Mr. Moorcroft's attempt; for if there had, we should have heard of it either from him or his successor. It therefore appears, that if Mr. Sewel had not shown its utility, we should never have heard of Mr. Moorcroft having performed it. I have also heard Professor Coleman say, that he performed the operation more than twenty years back; but when he said so, he by no means intended to lessen the credit due to Mr. Sewel; on the contrary, he imputed blame to himself for not persevering in it. I have heard there are other persons who have attempted to insinuate a sort of claim as being the suggestors of this operation. They are, however, in my opinion, all without any foundation in truth. I have considered

it necessary to make these remarks to oppose any insidious attempts to rob Mr. Sewel of the fame he has so justly acquired. Some evils certainly attend the performance of this operation; but I look at them as I should on the explosion of a powder-mill, a steam engine, a gas apparatus, or any serious evil which may occasionally attend any useful and important invention; and however such accidents may be lamented, powder and gas will be made, and steam applied as a mechanical power.

The fair way of balancing the account is, to put the evils in one scale and the advantages in the other, when it will appear which preponderates; and as far as my observation goes, and from all the information I have, it is greatly in favour of the latter. The evils I allude to are the loss of hoofs, consequently a loss of the animal.

Two cases which occurred at the Royal stud may serve to illustrate others: a mare seven years lame, and another five, were operated on for experiment. They both became sound; but about nine months after the operation, there appeared in one case a trifling separation between the horny and sensible sole at the toe. This increased daily, notwithstanding all my endeavours to subdue inflammation; it then extended to the coronet, and at this time there was considerable inflammation and swelling of the leg: the separation increased round the coronet, and in a short time there was a separation between the horny and sensible laminæ. I should have rather said insensible laminæ, as there was not the least sensation in the foot at this time. In this state the coffin bone was let through the hoof, and was fractured in many pieces. The other case was very similar to this, and

I have heard of other cases, where the animals, as it were, walked or stepped out of their hoofs. The progress and result of these cases are very distressing; but on any future occasion, and where a similar fate appears inevitable, the slaughter-house is the only humane course for adoption. I have heard of many similar cases in different parts of the country; but, on the other hand, I see many fine and valuable horses at work, that were of no use to the owner before the operation, and have continued at severe work now two years without any return of lameness; and I see no reason why they may not be as effective as they now are many years to come. It therefore becomes a question with the owners of lame horses, where no other remedy offers to be of any advantage, whether they will work them lame, sell them for little or nothing, or risk the chances of the nerve opera-

tion. A determination of these alternatives will much depend on the kind of work a horse under these circumstances may be required to perform. If a lameness is not severe, a horse may do slow draught without having recourse to the operation ; but, on the other hand, if a horse is required for quick draught or for riding, I conceive there are few persons that would not risk the chances of the operation. With stallions and brood-mares there can be no necessity to risk it, except in extreme cases of lameness. The two instances mentioned of failure in brood-mares that had been some years previously lame, but on becoming sound again never performed any sort of work, proves the experiment to have been made under every favourable circumstance: it however shows, that success much depends on the state of the feet previous to the operation.

In lameness of very long standing, where a change of structure has taken place to any considerable extent, and more particularly on the state of the joints within the foot, if the disease does not amount to a destruction of a joint, but a secretion of the synovia or joint oil has been stopped, and the cartilaginous covering of the ends of the bones are in a state of erosion, the animal is enabled, by the loss of sensation in the foot, to bear a greater degree of weight on these parts than they have been for a long time accustomed to; by which means are brought on all the distressing symptoms previously described. It therefore appears that the chance of success depends much on the length of time the disease may have existed previously to the operation. With horses with thin flat feet and weak laminæ, the operation is not so likely to succeed as with those where horn abounds. The

structure of the horse's foot is particularly favourable to the success of this operation, as there are no muscles within the horny box; therefore as the powers which put the foot in motion are situated at a distance a division of the nerve going to the foot has no effect in paralyzing any parts which are necessary to its motion; which might have been the case had it been otherwise constructed. It has been imagined, that the foot, after this operation, would become a mere block, and that the animal would be rendered dangerous to ride or to drive. On making close observations on this point, I am glad to find that it exists only in the imagination, as horses that we have now at work, who have undergone the operation nearly two years, are considered quite as effective, in every respect, as those which have not required it. It has also been stated, that the hoof and foot waste

after the operation; but I am glad to know that this observation is imaginary also. I have observed in hoofs where the operation has been performed, a more plentiful production of horn than before, and a greater disposition to grow in the natural form; and I think this is a consequence to be expected, as the irritable state of the foot being destroyed by the division of the nerve, the secretion is more likely to go on freely. When the operation has been performed before any considerable change of structure has taken place, I have no doubt that the original cause is in time removed altogether, by the animal being enabled to bear the full proportion of weight on the lame foot; as I have shown, that if the foot, from any cause, is long kept in a state of relaxation, the horn soon contracts, and tightens on the internal contents, and hence arises the utility of the

patten shoe being applied on the sound foot in cases of lameness.

I consider the nerve operation an important discovery, and I have no doubt that it will stand the test of ages. Some veterinarians exclaim against it, who nevertheless continually perform it, and assign as a reason, that they operate because it appears to be the only remaining resource; and that if they declined, others would not. Others condemn it as barbarous and cruel, and call it *tearing out the nerve.* I rather suspect that this disapprobation originates in the circumstance of the discovery not having been made by those who thus oppose it. Opinions of this kind from persons long in the profession may, perhaps, conceal the usefulness of this operation among their individual friends, but the important benefit it has already produced

is, I trust, too great to be overlooked by the public. The term *tearing* is also inappropriate, as in the operation, which is momentary, the nerve is divided with a knife.

It is useful to know that where the nervous influence has been restored, and lameness in some cases has returned, a repetition of the operation has been attended with the same advantages as in the first instance.

The operation itself is very simple. Having first ascertained the course of the artery by the pulsation, an incision is made through the skin, about an inch and a half or two inches in length; and on removing the cellular substance, the artery, vein, and nerve are all shown running together, the nerve on the inside of the artery and close to it. A needle may be readily passed

under it, leaving a thread, which, on pulling a little, enables the operator to separate the nerve from the artery with ease, and to take out as much as is considered necessary; after which, the skin should be closed with a stitch, which sometimes heals by the first intention; after which bleeding and physic are useful.

Since writing the preceding remarks on this useful operation, the subject of one of the cases I have alluded to as having worked sound nearly two years, has received a deep wound through the point of the frog, in that foot which had been operated on above the fetlock joint. Considerable inflammation came on, and the horse became very lame; however, through the means usually adopted to subdue inflammation, he became sound again in a few

days. This at once establishes the fact of sensation being again restored; and I have no doubt that this is one of those cases where the original cause of lameness has been removed by the operation, and that now he is no longer liable to those disastrous consequences, which on some occasions attend the performance of this operation. When it is performed below the fetlock joint, there is less chance of the part operated on being struck by the opposite leg, and sensation is more likely to be restored sooner than when performed above, in consequence of there remaining a small branch of the nerve which goes undivided to the front of the foot; but in laying the nerve bare in this situation there is more to cut through, which produces great inflammation and much swelling, and is often long in healing; but if the operation is performed above the fetlock, the inflam-

mation and swelling is trifling in comparison, when performed below the joint. I therefore, on the whole, prefer to operate above the joint.

CHAP. XII.

OBSERVATIONS ON SOME OF THE TOOLS USED BY SHOEING SMITHS.

[See Plate VI.]

The "butteris" (see fig. 1.) is in very general use in most parts of this kingdom, with the exception of London and its vicinity. It is an awkward instrument, used for the purpose of cutting out or removing any superfluous parts of the horn, previously to the application of a shoe: the cutting part of it is not unlike a thistle-spud, having a crooked iron shank fixed in a wooden handle, which has a round knob at the end: on this the smith puts his shoulder, and then taking hold of the crooked part of the shank and applying the spud to the foot, he, with the force of his

shoulder, digs out not only the part intended, but frequently other parts, making a deep cut into the horn, and not unfrequently into the flesh; thus rendering the animal for some time unserviceable, and producing a troublesome wound, often difficult to heal.

The "drawing-knife" is an instrument which was long in use for the purpose of what is termed "searching the foot;" and when horses became lame from nailing, or pressure on the sole, this knife was used to ascertain if any matter was confined under the horn; but, since the establishment of the Veterinary College, this instrument has been used in shoeing as a substitute for the butteris: it is now universally employed in this metropolis, and is found to be far superior to it. The drawing-knife, though a simple instrument, has been greatly improved by a very ingenious instrument-

maker, Mr. Long* ; in justice to whom I feel it proper to state, that from the zeal which he has shown in suggesting and improving many useful and important instruments, the Veterinary Art is considerably indebted to his ingenuity and skill.

Since the drawing-knife has been used by smiths as a substitute for the butteris, it is found requisite to employ it of three or four different sizes. A large one, (see Plate VI. fig. 2.) having a broad blade with a small turn, which is principally used for removing inequalities of the sole or crust ; the others (fig. 3. and 4.) are smaller, and of different sizes, with narrower blades, but larger turns. Much depends on the shape of these instruments and their turns being made of a suitable curvature ; as the large knife, though very convenient for the quarters and sole, would be awkward and un-

* No. 217, Holborn.

suitable to use about the frog, or on that part of the sole called "the seat of corns." The two parts last mentioned require a less knife with a larger turn; and here I must remark, that smiths are too much disposed to attempt to prepare the whole foot with the large knife, to avoid the trouble of keeping two or more ready, and in good order; this negligence sometimes arises from the instruments not being sufficiently sharp, or that the shape has been materially altered in whetting or setting them; they are generally sharpened with a rag stone, which is by no means calculated to keep them in their original form, for this ought to be the guide, supposing the knife to have been properly made. On inspecting shoeing boxes, it will be seen that the drawing-knives in use have generally lost the circular evenness in the cutting part of the turn, by continual whetting; that they have a hook or bill-like appearance,

and that the large or sole knife has usually inequalities on the edge. With knives so altered in their shape, smiths continually attempt to cut the frog, but instead of cutting, they tear the part, and remove also, in consequence of the awkwardness of the instrument, more horn than is requisite in some places, and not enough in others. All these inconveniences are very easily remedied, if a smith, when he observes an inequality either in the blade or turn of the knife, would apply it to the grind-stone (which is in every forge) for a few seconds: an even surface, both in the blade and turn, would thus be obtained; and afterwards a rag stone, which should be made flat and thin on its edge, can with facility be applied to the inner edge of the turn. With a stone so shaped, after the inequalities have been removed from the edge by a grind-stone, a knife is soon put into proper order; and the smith who does not pay due attention to

the state of his tools, cannot be very anxious about the manner in which his work is finished.

The hand or turning hammer, which, in London, the shoeing smiths have brought to great perfection, has three working faces, which are rounded, (see Plate VI. fig. 6.) and it has also a strong bill-point. This form is better than that of the ordinary hammers used in the country, which have only one rather flat-working surface, and a bill-end (see Plate VI. fig. 5.); with hammers of this description, shoes cannot be accurately turned.

I have thought it proper to describe these instruments, which are very important in the art of shoeing, but of others, which are also used, no particular notice is necessary.

CHAP. XIII.

ON THE ORDINARY METHODS OF SHOEING HORSES IN ENGLAND.

To attempt a particular description of the infinite variety of modes of shoeing horses in this country would be an insurmountable task, as there are not two forges whose methods are similar: I shall therefore confine my observations to those principles which are in general practice. Horses are too frequently shod in a rough slovenly manner, evincing that form and shape are the effect of chance, more than of design; a piece of iron bent, punched with holes, and nailed on at random, is more frequently to be seen than any thing like method. There are, however, many forges in London

that do adopt a system ; though in these, as well as in all others in England that I have seen or heard of, a form of shoe is in use which proves highly destructive to horses' feet. The ordinary shoe (see Plate II. fig. 1, 2.) of most forges is a flat piece of iron, bent to the form of the foot, but often differing in width and length, frequently much longer than the heels, and often much shorter ; the wearing surface has a groove or "fuller" all round the outer edge, in which there are usually four holes on each side, and these are kept to the outer rim of the shoe as near as the iron will admit ; the holes are punched near together, leaving a space at the toe, and also a considerable distance between the last nail and the termination of the shoe. The shoe on the ground side is convex : the inner rim, when the foot is on the ground, is the lowest part; from which to the outer edge it describes

an inclined plane. It is therefore evident, as the weight first comes on the inward rim of the ground side, and the crust bears only on an extreme edge of the shoe, that the whole weight must be sustained by the nails and the clinches. It is a common principle of all English shoes to be straight from the toe to the heel. On the foot side of the shoe, the nail-holes are made as near to the outer edge of the shoe as possible, in order to drive the nails through into the centre of the crust. The whole inner surface is an inclined plane from the outer to the inner rim, leaving an edge all round for the crust to rest on.

Though this form of shoe is more frequently met with than any other, yet there are some forges which make the wearing or ground surface flat.

The shoes are generally thicker at the heels than at the toes; and the edges, for the most part, are what smiths call under-hammered, which leaves the ground edge wider than the hoof, while the under part appears to be exactly of the size of the hoof; this is often a cause of cutting.

The shoe being thus formed, the hoof is divested of the superfluous horn from the crust, sole, and frog, and there is a never-failing practice of what smiths term opening the heels, which is cutting a great notch out of every heel, whether wide or narrow. The shoe is next heated and applied to the foot, which is thus burnt to the form of the shoe, giving it what is called a seat: others who do not get the seat by burning, when they have hammered the shoes to their fancy, cut the hoof and rasp it so as to fit it to that form, whatever it may be; if it

happens that the shoe is much less than the foot, the horn is struck off with a toe-knife, and rasped to make it the size of the shoe, after which the shoe is nailed on. The London smiths have a peculiar method of shoeing horses for dealers, particularly those with contracted feet. They "open the heels" by cutting out a great notch in the crust and bars, and by applying a shoe straight at the quarters and heels, and much wider than the foot, they give the foot an appearance of being open, and approaching towards the shape of a natural foot; but this artificial appearance only lasts till the horn grows down, when the contracted form again appears.

The ordinary bar-shoe is generally applied in cases of lameness, but more particularly in those arising from corns, sand-cracks, pumied feet, &c. The only dif-

ference between the bar and the ordinary shoe is, that in the former the iron is continued from the one heel to the other across the frog, the bar part being much narrower than the rest of the shoe, and its shape on the foot-side an inclined plane. It is usual to apply a piece of sole-leather rivetted on the bar for the frog to rest on, and thereby to raise the shoe from the part affected.

The preceding observations have only a reference to the ordinary method of shoeing the fore-feet of horses.

As the hind-feet are not liable to those diseases which produce the distressing effects found in the fore-feet, and as on this important fact observations will be made hereafter, it is not necessary now to enter on any particular description of the form of

shoe for the hind-feet ; to obviate pricking, pressure on the sole, cutting, forging, and over-reaching being all that is requisite to attend to — accidents which will be treated of in the course of the work.

CHAP. XIV.

OF THE SEATED SHOE.

[Plate II. fig. 3.]

The seated shoe was introduced into this country by Mr. Osmar, as being much superior to the principle of the shoe then in practice; but notwithstanding it might be considered as a real and important improvement, it did not at that time become very general. After a lapse of some years, the subject was renewed in a publication by Mr. Clark, of Edinburgh, who also highly recommended it. But still it did not appear to attract the public attention, until Mr. Moorcroft, who established a forge in this metropolis, pointed out the great advantages likely to be derived by its

adoption. It then began to be very generally used, and has since maintained its ground from its superiority over the common shoe.

This shoe is of an equal thickness, quite flat, and parallel from the toe to the heel, deviating in width according to the necessity of the case, and similar to the ordinary shoe with regard to the fullering, nailing, &c. The foot-surface of the shoe differs in having a narrow plain rim, about the width of the crust, all round the outer edge of the shoe, except at the heel, which, for about an inch and a half, is a flat surface the whole width, and the remaining part of the shoe is hammered or hollowed out, sloping from the inner edge of the seat, making it thin, except at the heel, which has the same thickness throughout. It is intended, that the crust should bear upon and be sup-

ported by the seat of the shoe, the nail-holes are placed in the inner part of the rim, but the principle of nailing is the same as in the common shoe. Mr. Moorcroft recommended, that the crust should be rasped down to a level with the sole, before the shoe was applied: this is certainly objectionable, as there would be a great probability of the sole coming in contact with the shoe, and producing pressure on the sensible parts; but if a portion of the horny sole be removed previous to the application of the shoe, no such inconvenience can arise.

The great advantage of this shoe, when compared with the ordinary shoe, is, that as the crust rests on a flat surface, instead of an inclined plane and bearing on an edge, contraction is by no means so likely to take place.

Still there are many objections to its use; the shoe being flat without the proper degree of curvature, and the manner of nailing, by pitching the nails inward, is equally destructive to the crust, although there is no strain upon the nails and clinches as in the common shoe. I have also observed, that the number of corns, when this shoe has been used, has by no means been diminished, which arises from the quarters being removed to fit the flat shoe, and the weight is then supported more by the heels than the quarters.

The seated shoe is also more difficult to make than any other, which is a great objection to its becoming in more general use than it now is.

Mr. Moorcroft invented an ingenious machine for the manufacture of these

shoes, which would have eventually reduced their price; but unfortunately the invention failed of success. I have understood, that some part of the tools could not be made sufficiently strong to withstand the great force required to cut out and stamp the shoe; and that, when the shoe was made, if it were put on without any alteration at the toe, the iron was so soft from having undergone no hammering after being heated, as to cause it to wear out in a short time.

CHAP. XV.

OF PROFESSOR COLEMAN'S SYSTEM OF SHOEING.

[Plate II. fig. 4.]

THE shoe recommended by Mr. Coleman for general use, is about the width of the common English shoe, quite flat and straight from the toe to the heel on the foot-side, and on the ground-side rather concave, with a deep fuller or groove all round as near to the exterior edge as the iron will admit; about eight nail-holes rather in the front part of the shoe, so that the last holes are at some distance from the heels. The most remarkable peculiarity of this shoe is, that it is three times thicker at the toe than at the heels; having a gradually sloping declination from the toe to the heels, something in the form of a wedge.

The method of fullering and nailing will be treated of under their distinct heads, as well as the advantages arising from the shoe being flat on the foot-side, and concave on the ground-side. I shall therefore here endeavour to point out the great evils arising from the chief peculiarity of this shoe, viz. the thin heels.

Being aware that Mr. Coleman's idea with regard to the foot, is, that the frog should come in contact with the ground, and in a great measure support the weight of the horse, I am not at a loss to conjecture the intention of this peculiarly shaped shoe, which is so well adapted to its purpose.

When a horse is shod with this thin-heeled shoe, what is the effect of the unnatural and strained position of the leg and

foot, when the toes are raised so much above the heels? And this must be the situation of all horses shod thus, excepting those which have become mule shaped by contraction; therefore it is these only which will bear a diminution of horn at the toe equal to the reduction of the shoe at the heels, which Mr. Coleman urges the necessity of paying due attention to.

Sprains in the tendons and ligaments often occur from their being unusually exerted; fatigue in the muscles of the leg soon shows itself in the action of the horse, by the inability to move the fore-legs quick enough to be out of the way of the hind ones, which often strike either the heels or some other part of the shoe of the fore-foot. The foot, in consequence of being brought so near to the ground, is more liable to suffer from the effects of

blows, bruises, &c.; and I have never observed that horses thus shod are less liable either to contraction or to corns.

There is but one situation where the horse may be quite as much at his ease with thin heels and thick toes, and perhaps more so than with common shoes; viz. when going down hill; but in no other position can this wedge-like shoe be convenient, either for the feet or the legs: on the other hand, when going up hill, what must then be their situation. And certainly tripping must be a consequence where the toes are thus thickened.

I am aware that Mr. Coleman attributes all these untoward effects to a misrepresentation of the principles he has laid down, and to a want of judgment to put them into practice; but the particular in-

structions, which he has so repeatedly urged, have only a reference to those feet which have been shod some time on the common English plan.

But supposing we commence with this plan of shoeing, and that no other has been adopted, what would be the effect? And why, if it be considered superior, has it not shown its pre-eminence after twenty years' trial, and that extensively too, both in and out of the army? Had it proved itself to be a preferable plan, it would certainly, with the trial it has had, have been adopted at this period in every forge, instead of which, I believe it would be difficult to find even one in any part of the kingdom where it is generally employed. And how many cavalry regiments are there, (who buy their horses young enough to begin fairly with any plan,) that have not deviated from the

Professor's system, notwithstanding he is their principal veterinary surgeon.

During the time I was in the Ordnance, and from the opportunities I have since had of observing the plan as adopted in some regiments, and from enquiries that I have made, I believe there are few, if any, where the thin-heeled system is in full force.

On the Continent, I am informed, that not only the cavalry but the whole country employ that system only, which is taught and promulgated at their public schools.

As the thin-heeled plan of shoeing has certainly not succeeded, I shall offer some reasons, which, in my opinion, have operated against it.

Mr. Coleman states, that the base of the natural and perfect hoof is a circle, and that this circular form cannot be maintained without uniform pressure on the frogs; and, that if they have not this pressure, they must become diseased, and the horse consequently lame.

In the chapters on flat and convex feet I have stated, that a circular form is by no means a proof of perfection, as diseases as frequently occur in them as in other forms.

It is also part of Mr. Coleman's theory, that, without pressure on the frogs, the cartilages of the coffin bone no longer act upon the coronary ring; and, that as the horn is secreted, it takes a wrong direction in consequence of this want of action on the cartilages. Hence, he says, all the disease which takes place.

If this were really the case, a sound horse would scarcely be found; as there are very few that have had this supposed benefit of thin-heeled shoes and pressure on the frogs. In my opinion, it is unreasonable to expect that pressure on so soft a body as the frog will be able to keep open the heels, which are so much more solid and compact, and we often see old horses with sound, though not circular feet, that have never been shod upon the thin-heeled system. Mr. Coleman remarks, "the proportion of weight on the hind-feet is trifling to that of the fore-feet;" but makes no observation on the absence of pressure, and the consequences attending neglect of the frogs of the hind-feet. He further observes, "if pressure was injurious to the frog, it would follow, that where there is most pressure, there would be most disease, and where there is least pressure, the least disease."

If this position be correct, all the horses that have been shod on the common system would be diseased; and how is it that we seldom observe the hind-feet to be diseased, though the frogs scarcely by any chance receive pressure; and if it is pressure in the natural state that is the specific against disease, why do we see so much in those feet that have never been shod? The total absence of all the permanent diseases in the hind-feet, which are so common and so destructive in the fore-feet, is a fact familiar to every person accustomed to horses. The cause of this difference Mr. Coleman has not attempted to elucidate, and it is a fact which it appears has baffled every writer upon the subject. I shall, however, presume to offer a few remarks upon it.

Some persons have urged as a reason,

that, as the hind-feet are generally well saturated with dung and urine, they are thereby rendered free from the diseases so common in the fore-feet.

If such an idea could for a moment be entertained, the beneficial effects of stopping the fore-feet with dung, mixed up with urine, I consider, would not have been overlooked; but, as yet, no person has ventured to recommend the practice.

I remember, when a pupil at the Veterinary College in the year 1798, that great care was taken to let the frogs of the hind-feet have as much pressure as those of the fore-feet, and roughing or turning up the heel of the hind-shoe was condemned exceedingly; the objections being want of pressure on the frogs, no action in the cartilages, &c. At this period, pressure on

the frogs was so much in fashion, that Mr. Coleman obtained a patent for an artificial iron frog, which was applied to give an increased pressure to the frogs when standing in the stables. This, I believe, is now quite out of use. Since then, Mr. Coleman obtained another patent for a method of making a claw on each heel of the shoe, to act as a clip on the bars of the hoof, which was said to have the property of averting contraction. Why have recourse to this expedient, if pressure on the frogs be sufficient? When I left the Veterinary College, fully believing in the theory as it was taught by Mr. Coleman, I began to practice the system with as much zeal as any of my contemporaries, adhering strictly to the principle of it. But in a few years, after a number of unsuccessful attempts to relieve or prevent contraction, corns, &c. by the application of it, I was led to suspect the correctness of the theory.

The facts which gave me reason to doubt the truth of it were, that notwithstanding the frogs of the hind-feet seldom, if ever, receive any pressure, in consequence of the heels being allowed to grow (which they generally are) more than those of the fore-feet, and also the turn-up of the shoe; that we still had no permanent diseases like those which occurred in the fore-feet.

As the structure of the hind-feet is the same as of the fore-feet, it is natural to suppose, that the causes which produce so much mischief in the one, would have the same effect in the other; but the diseases incident to the hind-feet, are almost all of so temporary a nature as to admit of immediate relief.

These facts operate, in my opinion, against the success of this system of shoe-

ing; and when the difference of susceptibility of disease between the hind and the fore-feet is considered, I think this circumstance may eventually lead to some useful practical knowledge.

I also consider, that if it were possible to bring the fore-feet under similar circumstances with the hind ones, we might expect to find some beneficial results; but it will be readily perceived, that there are many reasons, besides shoeing, which tend to produce this extraordinary difference. In the relative situation of the fore and the hind feet, the weight of the animal, whether in motion or standing still, is very differently distributed upon them. A much greater part of the body is to be sustained by the fore-feet, as well as the head and neck; and if the horse is used for the saddle, the weight of the rider is also to be

added. This increase of weight falls, from the position of the limbs, on the quarters and heels of the fore-feet. Whereas in the hind-feet, the weight, which is in itself trifling, is very differently sustained, and falls upon them in parts quite the reverse of the bearing on the fore-feet. For in the hind-feet the toe and quarters are the principal parts employed, either in action or when sustaining the weight of the animal. And I have no doubt, that the general absence of contraction in the fore-feet of dray-horses, when compared with other kinds, is in consequence of the similarity of the action between them and the hind-feet.

Having stated my ideas, as opposed to Mr. Coleman's theory of the use of the frog, it may be expected that I should state what I consider to be its functions. If it had been intended by nature, that the frog

should have constant pressure, we should certainly have seen the frog in a perfectly natural foot projecting below the heels when standing on a level surface; but this is not the fact: for, on the contrary, the heels descend lower than the frog, and the crust is that part which first meets the ground. Hence it is, that pressure on the frog, or the sole, is but partial, and only when the crust has first made an impression in the ground; for in a natural state it always descends below either the frog or sole.

The frog appears, from its tough and elastic nature, admirably calculated to defend the posterior part of the foot, to diminish concussion, and to counteract the severity of the blows and injuries the feet would otherwise be liable to when the horse is in action.

Mr. Coleman observes that the frog affords a spring to the foot: if this were the fact, we should have found it descending much below the heels; but as the surface of the frog is only on a level with the shoe when shod on his plan, I will ask, what spring does the frog afford, when the weight is sustained on the heels?

I wish to impress on the reader, that I do not consider uniform and continual pressure on the frog as at all necessary to the healthy state of the foot, and that the means employed to procure it are generally at the expense of some other part, either of the foot or the leg. Mr. White in his treatise states, that "there can be no doubt, that a horse in a state of nature has his frog almost always in contact with the ground; and then, of course, he feels no inconvenience from it; but when burdens

are placed upon his back, and he is driven about on hard roads, he is certainly in very different circumstances: and if the frog in such cases were constantly exposed to this severe pressure, it would sometimes, I believe, occasion lameness." Mr. White further remarks, "there is a kind of deformity where the hoof loses that oblique direction, and is approaching towards the perpendicular, at the same time the heels become very high. In this case it is necessary to reduce the crust at the heels, and apply the thin-heeled shoe." If I understand Mr. White rightly, this case of deformity is the only instance in which he feels justified, in applying the thin-heeled shoe.

Since the preceding remarks on Mr. Coleman's system were written, I have been favoured with the perusal of a book by Mr. Peall, Veterinary Professor and Lecturer

to the Dublin Society, on the Diseases of the Horse, in which one chapter is devoted to the general treatment of the feet. In this work Mr. Peall has displayed great talent and genius: and considering the publication generally, it is but justice to observe, that, in my estimation, he has rendered a greater public service, on this important subject, than any preceding writer. In many of his remarks I perfectly coincide; but with some of them my opinions are at variance.

Those to which I more particularly allude, I cannot perhaps do better than give in his own words. At page 153. Mr. Peall says,

" As I can lay claim to no discovery upon this subject, which Professor Coleman has treated in a way that has done him the

greatest honour, in spite of the cavillings of envy, ignorance, and prejudice, I must refer my readers for information on this head, to his very elegant and luminous work on the horse's foot.

" Nevertheless it is right that I should remark in this place, that the unprejudiced experience of many years, made upon a very large scale, has convinced me that *no other principles of shoeing than those which Mr. Coleman has laid down, are capable of preserving the foot of the horse from disease, or are so well calculated to ward off to the latest possible period, that slow and gradual contraction which the feet of all horses that are shod are inevitably exposed to.*"

Having read these remarks, I confess I was not prepared to meet with the following observations at the conclusion of the

same chapter, and at a distance of only twenty-eight pages. "I have already disclaimed the idea of writing a regular treatise on shoeing; but having recommended Mr. Coleman's work, and the principles of shoeing which he has laid down in preference to any others, it would be improper for me to close this subject without informing my readers, *that the use of the thin-heeled shoes formerly recommended by the ingenious Professor, has been laid aside for some time at the London Veterinary College, from the experience of its inutility.*"

When the reader has reflected on the tendency of the very opposite opinions, Mr. Peall has given on Mr. Coleman's system at the commencement and at the conclusion of his remarks, I think he will have no difficulty in making up his mind on the use of the thin-heeled shoe and

uniform pressure on the frog. When Mr. Peall announced the abandonment of the the thin-heeled shoe by Mr. Coleman, I expected that we should, at the same time, have been put in possession of some system which had been substituted as answering a better purpose.

CHAP. XVI.

OF MR. BRACY CLARK'S SYSTEM OF SHOEING.

[Plate II. fig. 6.]

Mr. Clark has published a work on shoeing, in three parts; two entitled "Dissertations," and the third "Stereoplea," which I have carefully perused.

I feel little inclined to enter particularly into the merits of this publication, as that would increase the present chapter considerably, though I fear not very beneficially. I shall, therefore, make some general observations on such points as I consider to be most material.

In the first part a plate is given of the horse's foot, which is described as taken

from a foot that has never been touched by any instrument, at the period of five years old, and representing its natural form. It is there shown bulging out in some parts, worn away in others, and exhibits a figure by no means either uniform or natural. I have before observed, that this cannot be a correct method of obtaining the natural form of the foot, as the hoofs, like the human nails, are continually growing; and I need not ask what would be their appearance, if allowed to grow five years without being touched. Mr. Clark proceeds with taking casts of the same foot, at different periods, after having been shod for some years on the English system; but they only exhibit what is unfortunately familiar to every person conversant with horses, viz. the alteration in form, which ultimately produces all those diseases Mr. Clark so well describes.

Mr. Clark has taken great pains to establish the elastic property of the hoof, which was already well known, and also describes various parts of the foot, which, as he states, have hitherto escaped notice; he not only ascribes new functions to these parts, but at the same time designates them with a variety of names not very intelligible. Mr. Clark was some years endeavouring to prove that shoes were unnecessary, but finding that he could not well do without them, he invented several contrivances to fix on the shoe without nails.

Now it is very obvious, that a shoe of this kind would be extremely complicated, and that any means applied to the outer part of the foot sufficiently tight to keep it on when at work, would produce all the compression and bad consequences which he says it is so necessary to avoid. He also remarks, that the pernicious consequences

of shoeing horses have never till now been rightly considered nor understood, either by veterinarians or smiths.

Mr. Clark's ideas, however, with regard to Mr. Coleman's system, appear to be in unison with my own; for he observes, that the want of success in the application of the thin-heeled shoe, is a proof that the theory is unsound.

Mr. Clark doubts, that hot litter and the heat of stables, have a tendency to produce contraction; nor does he consider, that the common shoe (which he states to be the best) is calculated to produce it, and he thinks there is not so much mischief from the inclined plane of the English shoe as is apprehended, unless it be carried to an extreme; to me these facts appear so plain and self-evident as not to admit of any

doubt; and I cannot conceive how the pernicious effects of heat, litter, and the ordinary method of shoeing, should be for a moment mistaken.

Mr. Clark remarks, that the French method of shoeing is more conformable to the natural form of the foot, and that it harmonises with the shape of the coffin-bone, which he illustrates by stating, that if a coffin-bone be placed on a flat table, it will be seen that there is a considerable space between the toe and the table. This is certainly correct; but Mr. Clark's objections to French shoeing are, that if the flat form be departed from, there will be a difficulty in going back to it again. I would ask Mr. Clark, if he considers that the French shoe is more conformable to the natural shape of the foot, what reason there is to go back to a bad system again?

He states, that it is believed French horses are more sure-footed, and go better than ours; and suggests as a reason, that it is probable that "*their feet are of a coarser kind than ours.*"

I now introduce to the reader Mr. Clark's *great* discovery, which he observes, will form "*a basis for the repose of the profession.*" I most cordially wish he may not be mistaken in so sanguine an expression; though his great expectation appears to have been formed from the good effects of the plan in two cases only. The discovery consists of a shoe of the common English shape with a joint at the toe, which he describes to possess very extraordinary properties to relieve the feet from the restraint of the shoe and nails, by admitting the natural expansion of the hoof, and averting thereby all the evils of

the common principle. Experience alone can prove the merits of this plan, and Mr. Clark's sanguine expression, I think, would have appeared better at the end of several years of successful practice. He observes, that as no patent has been obtained for this invention, it is open to the public. How such an observation could appear in his work, when he acknowledges that shoes with joints at the toes are to be found in every forge, it is difficult to account for.

Mr. Rotch took out a patent two or three years back for a shoe, the principles of which were similar to Mr. Clark's; but it was found to be unfit for any purpose, from its being in three or more pieces, held together only by a piece of leather in the form of the shoe, to which the pieces were riveted.

Mr. Clark, like Mr. Coleman, has offered no reasons for the comparative difference of the diseases in the fore and the hind feet. If a jointed shoe should appear to be useful for the fore feet, it is obvious it cannot be necessary for the hind feet, which Mr. Clarke recommends, as they are free from those diseases which it is intended to obviate.

If Mr. Clark's reasoning on the principles of the shoe and nails (as preventing the natural expanding property of the hoof) be considered as the cause of so much disease, I will ask, what is the reason we observe no such diseases in the hind-feet, which are under the same compression and restraint from the shoe and nails, and even more so than the fore-feet; for the nails in the hind-shoes are generally brought nearer

to the end of the heels whereby very little expansion can take place.

On further consideration of the principle of the joint as connected with the motion of the foot, as it is united by a cylindrical rivet, on which it acts, if we mark the parts on the foot opposite to the nail-holes in the shoe, when the foot is in a relaxed state, the holes would not correspond or be opposed to the same parts of the foot, were it practicable to mark them in the expanded state; for it is obvious that the distance from the holes to the joint, in the relaxed state, must vary according to the degree of opening or closing of the joint when the foot is in action. This may easily be exemplified by a shoe on a piece of paper: mark the paper opposite to the centre of the rivet, and also the part opposed to the last nail-hole, supposing it

to be in the relaxed state; then open the joint, the rivet remaining precisely on the same spot, and mark the part opposed to the last nail-hole, take a pair of compasses and strike a circle on the mark first taken, and then another circle on the mark last taken when the joint was open. A variation will then be seen in the distance from the joint to each circle. If it is then considered, that the shoe is nailed on the foot when in a state of relaxation, and that the nails are firmly fixed and immoveable, it must follow that the supposed expansion and relaxation of the hoof by the action of the joint, is fallacious. But if we for a moment admit, that the weight of the animal in action is such as to overcome these eight opposing points, the strain on the nails must however be so great when the joint opens, that they must be drawn nearer to the joint, and con-

sequently soon became loose: and also, not improbably, tear out a piece of the crust, and the shoe no longer be secure on the foot.

In order to admit of expansion and relaxation of the hoof by a joint, it would be necessary to make the nail-holes wide enough to allow sufficient play between the shoe and the nails, thus producing an effect similar to the end play of carriage-springs. But even supposing this provision was made, the shoe would soon tear out the nails.

Should it eventually appear, that great advantages arise from the shoe with a joint at the toe, I must disagree with Mr. Clark in the selection of the common English shoe for its trial; and I am of opinion, that any advantages, if there are any, which

arise from the use of the joint, will be more than counterbalanced by the ill effects of the inclined plane and mode of nailing of the shoe now in common use.

CHAP. XVII.

OF THE FRENCH SYSTEM.

[Plate V. fig. 6 & 7.]

The French shoe is perhaps rather wider than the common English shoe; it is convex on the ground side, and concave on the foot side, and equally thick throughout. It has eight nail holes at equal distances round the anterior part of the shoe; but the last hole on the inside quarter is generally at a greater distance from the end of the shoe than the one on the outer quarter; the holes are punched with a square countersunk head, deep into the shoe, and at some distance from the outer rim, and they are made obliquely, to give the point of the nail a direction outward.

On the foot side of the shoe there is a much greater space between the nail-holes and the outer edge than in the English shoe; and instead of the shoe being straight from the toe to the heel, it is considerably curved at the toe, which is called by the French veterinarians "*the adjusting balance.*"

It has been objected by some persons, that this shape is unnatural, because it does not correspond with the form of a foal's foot; but this opinion, I think, does not in any way prove it to be so, because the coronet at that age is considerably wider than the base of the foot; hence, if such a notion was correct, we might expect to see the base smaller than the coronet at five years old, when the foot is full grown.

The advantage of the French method of

nailing on the shoes, is so very superior to the English, and the form of the shoe is so admirable, that I cannot conceive, situated as we are so near to that country, how so superior a system has not long before this period been attempted among us, for we certainly have not seen any plan of shoeing, which possesses so decided a superiority.

The advantage of the manner in which the French nail on the shoes will be noticed in the chapter upon nailing. I shall, therefore, here mention only the benefits of the shape of the shoe.

In the work of Monsieur Jauze lately published on shoeing, the advantages of the French form are pointed out, and contrasted with the English. His remarks upon the consequences likely to follow the use of the

common English shoe are certainly substantiated by the deplorable state of our horses' feet.

If we refer to the action of the fore-leg, it will tend to explain some of the advantages of the curved shoe.

When a horse is about to move, the first indication of motion in the fore-leg is a bend at the knee, which necessarily raises the heels, and they become more and more elevated, till the toe (which is the last part that leaves the ground) is lifted for the moment that the foot is suspended. The base of the foot, just at its leaving the ground, is almost perpendicular when the knee is bent to its fullest extent; the foot is then in the same position with the heels of the shoe pointing upwards. If we consider this first part of the motion of the

limb, we find the movement of the foot very nearly describes a semicircle; and on viewing the form of the joints connected with action, the necessity of a curve at the toe is clearly demonstrated: again, the form of a shoe worn out at once shows that it must be more suitable to put on a new one of that form, rather than suffer the action of the leg to be opposed until it is worn to that shape. In the second part of the action, when the foot comes again to the ground, the quarters and heels touch first, and they are the only parts occupied in placing it on the ground again. There may be deviations from this general rule, as in those horses that have bad action; also when horses are drawing heavy weights, it must necessarily differ. The fore-legs may be considered simply as pillars of support, having no power of themselves to propel the body forward, pro-

gression being entirely performed by the hind parts. If it were not so, the action would be different, as I have before observed it to be in those horses that have great weights to draw, and this may be more readily observed in any draught horse going up hill.

I have offered these few remarks upon action, in order to bring the reader's attention to the curve of the French shoe at the toe. This form of shoe certainly harmonises more with the motion of the fore-foot than the English does; it affords a greater surface of bearing at the toe, than the projecting ridge of the straight ordinary shoe, and is much more calculated to allow of the motion of the leg and foot, the labour of the muscles is also diminished, and the limb being in its natural position, the ligaments have less imposed upon them; they are

more at ease, and consequently are not so liable to be strained.

It may not be inapplicable to remark the facility with which the Indian people move in their wooden shoes, which are considerably curved at the toe, when compared to the difficulty of moving with those, that have a straight unyielding sole.

The shape of the coffin-bone is also another proof of the French system being more consistent with the principles of nature, than the straight ordinary shoe. *

* If the coffin-bone of a fore-foot is placed upon a level surface, the quarters and heels are the only parts in contact with it; which proves that they are intended by nature to meet the ground first, and to bear the greater proportion of weight; but if the quarters of the hoof be removed to admit of the straight shoe, the portion of weight intended to be borne on the quarters must be thrown upon the heels, and hence the great mischief which ensues from the common English shoe.

If we contrast the curved form of the French shoe, with the straight line of the English, it is very obvious, that the latter is as much calculated to oppose the action of the leg and foot, as the former is to facilitate it. For in order to apply the straight shoe, the toe is allowed to grow and to project far beyond the extent proper and necessary for the protection of the internal contents: and in addition to this, if the shoe be made three times thicker at the toe than at the heels, the opposition to action must be increased in proportion.

Notwithstanding that I am fully convinced of the decided superiority of the French method of nailing on the shoes, and of the peculiar advantages of the curve at the toe, still I have two objections to the French system in general, viz. the convex form of the shoe on the ground side, and

the concave form on the foot side. I object to the first because the horse is by no means so safe or secure on his feet, more particularly when going over stones. To the second, I refer for my objections to the chapter on the common English shoe, where the effects of the concave form of the foot side of the shoe are fully described.

CHAP. XVIII.

OF THE PERSIAN AND OTHER FOREIGN SYSTEMS.

[Plate V. fig. 2.]

The Persian and Turkish shoes resemble each other in every particular; they are made of a thin plate of iron, which, as I have been informed, is hammered to the shape when cold. The shoe nearly covers the base of the foot, and has only a small circular hole in the centre, and a projecting ridge all round the outer edge of the shoe, both on the foot as well as on the ground side. It has four round nail holes on each side, rather near together, and is curved both at the toe and the heel.

The thinness of this plate of iron shows, I conceive, that in these countries, the

roads are very different from ours. If a shoe of this form wears long enough, there is a material advantage in its light weight, and the defence it affords from loose stones. How far the union and the curve at the heels may be appropriate for those countries I am unable to judge. It will not, however, produce any of those pernicious diseases which are the common effect of the English shoe. The manner of nailing is rather curious, and will be mentioned in the chapter on that subject.

Of the Barbary Shoe. The Barbary shoe is very similar to the Persian: it is made from a thin plate of iron, with the ridge hammered all round the outer edge. The nail-holes are quite similar to those of the Persian, the heels are united, but the space in the centre is of a triangular form, and the shoe being much narrower than the

Persian, the space in the centre is of course of greater extent. The toe is very wide, and is more of a square than a circular form. The shoe is concave on the ground-side, and convex, or rather a plane inclining from the inner to the outer rim, on the foot-side, and is considerably curved both at the heel and at the toe. I have great reason to believe, that the shoes here described were made by one of the first workmen of that country, as they came on a horse which was selected, with permission, by the English envoy, from the Dey of Algiers's stud.

If this be the form of the shoe in general use in that country, it is a good specimen of their superior judgment. Its only similarity to the English shoe is, that it is made of iron, and is put on with nails; but it possesses very decided advantages in the concave ground surface, the inclined plane,

outward on the foot side, and the curve at the toe. How far the square toe, the thin plate, and the union and curve of the heels may be advantageous, I cannot determine. I offer these remarks only on the shoes in my own possession.

Portuguese Shoe, (Plate V. fig. 4.), is a flat plate of iron, with a ridge round the outer edge, like the Persian and Barbary shoes; but the plate is much thicker. It is quite flat on both sides, the nail-holes are of an oblong square shape, very large, and extend far into the shoe, which is nearly round, covering the bottom of the foot, except a small hole in the centre, similar to the Persian; and the heel, unlike the others, is turned down, as I believe, to give greater security to the foot in travelling over the narrow dangerous roads on the edges of precipices. The principle of

nailing is the same as the French, and being flat on both sides renders it far superior to the English.

The *Spanish*, *Flemish*, *Italian*, and *Swiss*, are inferior copies of the French.

The *German* shoe (Plate V. fig. 5.) is more like the English than any hitherto named; but it differs from it in being flat on both sides, and the fuller or groove is so far from the edge of the shoe, that the principle of nailing is nearly the same as the French.

The *Dutch* and *Russian* shoes are very rough copies of the German.

I have given this brief description of the shoes of different countries, in order to shew that they all partake, more or less, of the French system.

CHAP. XIX.

THE AUTHOR'S SYSTEM.

[Plate IX. fig. 1, 2, 3, 4.]

In the preceding pages the reader will have observed, that I have noticed many advantages in the French principle of shoeing, and that I have stated that it is, in my opinion, superior to any system that has come within my observation.

From the information I have been able to collect from French authors, from veterinary surgeons, from cavalry officers, and other persons who have attended to the subject when in France, and who have particularly observed the state of the feet of horses in that country, I am fully borne

out by their testimony, and my own experience.

In a conversation with Mr. Sewell, the Assistant Professor at the Veterinary College, who has recently twice visited the Continent to enquire into the state of the veterinary art, he remarked, with a degree of earnestness that showed the impression which their mode of shoeing had made on his mind, "That he had seen more lame horses on his return, in the stage-coaches from Harwich to London, than he had met with during both his visits on the Continent." In the report which Mr. Sewell has lately published, addressed to the governors and subscribers to the veterinary college, it appears that he travelled through France, Germany, Prussia, Flanders, and Holland, visiting all the public veterinary schools.

Mr. Sewell was apprenticed very young at the Veterinary College, where he has continued to this time, and I think after twenty years' experience in the principles of pressure on the frogs of horses' feet with thin-heeled shoes, that it must be admitted, that he is fully competent to appreciate the merits of such a doctrine.

After the foregoing declaration, I will leave the reader to draw his conclusions on Mr. Sewell's opinion of the thin-heeled system, or of any other at present in general use in this country.

To Sir Benjamin Bloomfield, who is on all occasions ready to promote whatever appears likely to be useful, I beg permission publicly to express my respectful gratitude, for having obtained for me so admirable an opportunity to ascertain the superior ad-

vantages of the French system, with such alterations as occurred to me, in the extensive royal establishment with which he is connected. It is very gratifying to me to find, after four years' trial, that the establishment is daily deriving benefit from its adoption; and I trust, that the public also will eventually be convinced of the many advantages which this system possesses.

There is, however, a circumstance which may operate against the proof of the utility of this plan, so soon as it did in this establishment; namely, the custom of families to leave the metropolis many months in the year, when the common method of shoeing may probably be resorted to, and hence, any advantage which might arise during a few months in town from the use of the method here recommended, would be de-

feated by the practice of the old system in the country.

In describing the French method, I observed that there were, in my opinion, two great objections to the shoe used in that country, viz. the convex ground surface, and the concave foot surface; my reasons for disagreeing with this form on each side of the shoe, have been stated in the chapter on the French system. In the shoe I have adopted, I have reversed the form on each side, making it concave on the ground-surface, and convex on the foot-surface, with an inclination from the inner to the outer rim. To effect this form on each side, it is necessary that the shoe should be sloped or bevilled on the ground-side, from the outward to the inward part all round the shoe, except about an inch and a half at the heels. To accomplish this inclination on

the foot-side, it is necessary to thicken the inner part at the heels, as far as the flat surface extends.

It may be supposed, that a plane inclining the reverse of the common English shoe, will produce diseases in the feet of horses which have not appeared before. This is probable, if the inclination be carried to an extreme; but some years have elapsed without an instance of the kind in my practice. I consider, therefore, that it is not likely to occur. There is only one class of hoofs that such a shoe could be applied to, viz. those with extremely concave soles, which are invariably strong, and have abundance of horn, and require a greater opposition than any other to counteract contraction by the inclination of the plane. With all other kinds of feet, if the shoe is clear of the sole, it is not practicable to

make the inclination to such a degree as to prove injurious.

The manner of punching the nail-holes, and the curve at the toe, are similar to the French; but it is necessary that the outward edge of the inside of every shoe should slope inward to avoid cutting.

This comprises the form of the shoe I have adopted with so much success; and it is satisfactory to find, that the form of this shoe presents no difficulty to any moderate workman, and when a little accustomed to the shape, it is made with more ease than the common shoe. For general work, the best English iron will last until the hoof wants paring. From three weeks to a month is a right period for shoes to remain on the feet; but for hard-wearing horses, and those that work hard, English iron will

require steeling at the toes; but in such cases Swedish iron will be the best. Having mentioned the peculiar advantages derived from the curve at the toe, I consider it necessary to make some remarks on the advantages of the form of each side of the shoe. The concave ground-surface renders the animal more secure on his legs, as he has a greater purchase on the ground, and by this form the weight is thrown on the crust, or wall, which prevents any unnecessary strain on the nails and clinches.

In a work published nearly a century since by Soleseil, a French veterinarian, he recommends an inclined plane outward on the foot-side of the shoe, for contracted feet; but his method of obtaining this desirable form, is objectionable, inasmuch as he proposes to thicken the inner rim, and to slope or bevil the shoe gradually to the outer,

leaving it much thinner than the inner one. No doubt a regular plane inclining outward may be obtained in this way, but it is at the expense of making the ground-surface very convex; by which means all the points of bearing must necessarily be on the inner rim, when thickened and raised sufficiently to clear the sole. This form of shoe, though calculated to oppose the disease for which it was intended, produces an inconvenience which I have endeavoured to avoid, viz. an unnecessary strain on the nails and clinches, and all the consequences of their starting; it besides furnishes a very insecure form for the ground-surface.

The plane inclining outward on the foot-side of the shoe, I am aware may by some persons be objected to as impracticable; but as I had formed an opinion, that a shoe

so shaped might prevent contraction, and other permanent diseases of the feet, I determined to try it, because it appeared evident to me, that when the weight of the animal comes on a shoe of this form, it must have a tendency to expand instead of to contract the hoof, and I have found, from much experience, that the obstacles opposed to this form existed only in theory, as there are none in practice.

It is, however, necessary to remark, that the degree of inclination must be regulated by the previous state of the foot, and its propensity to contraction. There are, like all other general rules, exceptions to this; but they are, however, very few. When it is recollected that the horny sole, if not diseased, is concave, it will in course admit of a convex surface being applied to it; and when the superfluous parts of the horny

sole produced since the last shoeing are removed, and the crust at the quarters are preserved firm and good, there is scarcely an instance where this mode of shoeing cannot be put into practice, and sufficient room be left also to pass a picker between the shoe and the sole to the nails. Should a foot, however, be in such a state as not to admit of a shoe of this description, if the horse is valuable, I have before recommended rest in a large loose place or paddock until the horn is restored; but if he is required to be shod under these circumstances, the state of the foot will in general indicate the form of shoe most suitable for the occasion.

Having described the shoe I prefer and recommend for general use, I must explain the necessary previous preparation of the foot in order to receive it. When

hoofs are protected by shoes, the consumption of horn by wear and tear is nearly prevented; but as the growth of the hoof is constantly going on, it is evident that all the superfluous parts will require to be removed at every period of shoeing, otherwise it would run into a state of exuberance similar to the human nails, if they were not cut. The first part to be reduced is the toe, which should be removed with a knife or rasp on the sole-side of the foot, keeping in view the necessary curve: the next parts are the heels, which should, if they descend below the frog, be rasped to bring them on a level with it: having attended to these two points, it will then be seen how much it is necessary to remove from the quarters, leaving them full and strong, but in a straight line from the heels to the curve, which allows the foot, when in action, a flat part to land on, and describes a space equal

to the landing part of the foot when shod with a parallel shoe. This direction differs a little from the French "adjusting balance," inasmuch as they direct four points of adjustment at the toe, and two at the heels, which leaves the quarters rounded, and renders the foot not so secure on the ground. The sole next must have attention, the superfluous parts of which that have appeared since the last shoeing should be removed, this will leave it concave, and the crust or wall below the sole. Mr. Moorcroft observes, that paring the soles has a tendency to bring on pumiced feet, but I have not observed any such effect; on the contrary, if the sole is allowed to grow too thick, it loses its elastic property, and the sensible sole suffers in proportion to the degree of thickness and want of elasticity. The next and last part which requires attention is the frog. If it is smooth, firm,

and even on its surface, cleft, and sides, it will not require the use of the knife; but if it be too large, rough, or uneven in its appearance, all the superfluous parts should be removed in the way I have described in the chapter on thrushes. The foot will now be ready to receive the shoe, which may be applied without fear of producing any inconvenience from the alteration which has been made from the previous method, but which, on many occasions, has been the cause of serious mischief in going from one plan to another.

It is necessary to observe when a shoe is nailed on, that it should be about one-eighth of an inch wider than the hoof at the heels, also a trifle longer than the termination of the horn, or as much wider and longer as is necessary to prevent the shoe imbedding itself within the crust, between the periods

of shoeing. This would take place by the growing state of the hoof, if it were an exact fit when first put on, and often produce corns, &c.; it is equally necessary, that the shoe should be neither too wide nor too long, as that would produce a leverage that would be injurious to the foot. It may be supposed, that, by leaving the shoe wider than the hoof, cutting would be a consequence, but as the heel is not a part where striking occurs, there is nothing to apprehend, as the cutting part of the foot is before the quarter, and approaching nearer to the toe. It is also necessary to remove a small portion of the inner edge of the crust at the heels and quarters, leaving it sloping a little inward; this will fit it to the inclination of the shoe, and allow the crust a bearing on its whole thickness. With horses that have long pasterns, it is considered useful to increase the thickness

of the shoe at the heels, with a view to give support and to counteract too great a bend in that part; nevertheless, if it is thickened more than usual, it is evident that it would occasion corns by increasing the pressure on the heels, and would also give them a shelving forward direction.

Having described the shoe, and the previous preparation of the foot to receive it, I consider it necessary to make some observations on the advantages that attend the adoption of it.

It has been shewn, in the preceding part of this work, that a material diminution of permanent diseases of the feet has taken place in this establishment, and also an evident improvement in them generally; and that the proportion of lame horses has been very considerably reduced. I could

enumerate many instances where corns, contraction, and other deformities of the feet have been removed altogether.

Notwithstanding the high opinion I entertain of the advantages of this method of shoeing horses over any other that has come within my observation, I am, however, prepared to expect that we shall occasionally have lame horses, not from causes occasioned by this mode of shoeing, but from the battering and concussion of the feet when in quick motion over stones or hard roads.

It has been imagined by some persons, that draft horses, when going up hill in curved shoes, cannot have the firm hold of the ground that the straight English shoe is supposed to afford, and that their fore-feet are more liable to slip back. Now I

am convinced, that every one who has noticed the points of wear in the English shoe, will admit, that when the sharp edge of the toe of the common shoe is worn off, which is done in a very few days, the then form renders it far more likely to slip than the broad surface of the curved toe, which, being at first put on of the shape which the English shoe acquires by wear, is consequently free from the disadvantage of the sudden and smooth slope thereby occasioned. Thus the supposed benefit of the straight shoe is of so short duration, as to be by no means an equivalent for the great inconvenience produced by it three-fourths of the time it is in wear, besides also the impediments which an elongated toe opposes to action.

Those persons who may be averse to the adjusting curve of the French shoe, will find

that the next best shape is a perfect plane (Plate IV. fig. 4.) on the foot side, and the same on the ground side, of the width of the nail holes all round, (which should be of the French form,) and the remaining part of the web or width of the shoe should be sloped or bevelled from the inside of the nail heads all round the shoe to the inner rim, with the exception of from one to one inch and a half of flat bearing on the heels, and the shoe should be of an equal thickness from toe to heel.

CHAP. XX.

ON BAR SHOES.

[Plate III. fig. 3 and 4.]

Perhaps there is no shoe which can be so generally applied as the bar shoe, and if I were compelled to confine myself to the choice of one, I should most decidedly select the bar; there is, however, a strong prejudice against their use, and I have, on many occasions, observed horses crippled, and very tender with plain shoes on, and compelled to work in that way rather than have a bar, when, in all probability, a bar might have enabled the horse to go sound. This prejudice has arisen from their not having been resorted to except in cases of emergency; so that, to see a horse with a bar shoe is considered as a notification of

some imperfection, which materially deteriorates his value, and as horses are for the most part a marketable article, it is not a matter of surprise why this circumstance should operate in this way ; however, those persons, who may have a valuable animal possessing every desirable qualification, can have no reason to get a fresh rather than a good horse, when such a prejudice of fashion will have no influence. Bar shoes are intended to remove pressure from one part of the hoof and to convey it to others, and are used more particularly for corns, sand-cracks, pumiced feet, breaches in the crust, &c. &c. The manner of applying the ordinary bar is, however, very objectionable, as it corresponds in every particular with the form of the common shoe, with the exception of being continued all round, and uniting both heels of the shoe together, forming a bar which covers the

the posterior parts of the foot. This bar is much narrower than the other parts, and is bevelled and thicker behind, and sloping towards the point of the frog. It is, therefore, similar to a hollow cone, allowing the weight of the animal to bear on an edge only, which produces all the injurious consequences of the common shoe. Pieces of sole-leather are frequently rivetted on the bar to raise the shoe further from the part suffering; but in many cases where I have seen this practice resorted to, the increased pressure upon the frog produced more mischief than the disease it was intended to relieve; in other cases, some parts of the bar are what smiths call set down, so as to form considerable shoulders on the foot side, which are intended to take the bearing on the nearest sound part, leaving a hollow space opposed to the diseased part. This, however, can only be temporary, as

the additional pressure thrown on the shouldered part is so great, that the strongest crust is not equal to it long.

A narrow bar in the centre of the shoe is on some occasions applied in flinty countries as a defence to the sole, and is said to be useful. I consider the great use of a bar shoe to consist in affording a greater surface of defence than any other shoe, which enables us to determine the weight of the animal more generally on the foot by equalizing the pressure on more bearing points than a plain shoe. There is a numerous class of horses whose hoofs are thin and weak, and not sufficiently strong to support the weight of the animal in battering over hard roads at a fast pace without inconvenience. This appears at the heels and quarters, where, instead of the horn having grown much since the last time of

shoeing, it will be found to wear faster than it grows; that the sole is separating from the crust, which bends inwards, or projects in a shell outwards, and that the heels take a shelving direction forwards.

In all feet of this description these consequences shew themselves more or less, and for them I prefer a bar instead of a plain shoe, to prevent the destructive effects which arise from the use of any plain shoe.

I never find any difficulty in keeping flat-feeted horses sound, at work, with bar shoes; but I have frequently found, on a trial of plain shoes, that I was compelled to go back to bars again.

Instead of raising the bar by rivetting pieces of leather on it, or of forming shoul-

ders or projecting parts (the practice with the common bar shoe), I propose it to take as much general bearing as the foot will admit, allowing the crust and frog to have an equal bearing to relieve the suffering part; it will only be necessary to remove the horn of that and the contiguous part, leaving a small space between the shoe and the crust. When the heels and quarters have been worn away, and the frog projects below them, it will be necessary to set down the part of the shoe opposed to each heel, so as to admit a slight bearing on the frog, (see Plate III. fig. 3.) otherwise the pressure would be too severe; but if the heels and quarters are on a level with the frog, that precaution will not be required; a plain flat bar (see Plate III. fig. 4.) will in this case, be more suitable, and instead of making a narrow bar, which soon imbeds itself in the frog, and produces so much partial

pressure that it cannot be worn long without inconvenience, I use a bar wider than any part of the shoe; of an equal thickness in all its parts, and perfectly flat on both sides, which affords a much larger and more even surface to tread on, and gives likewise more points of bearing on the frog. In every other respect a bar shoe corresponds both in form and principle with the plain shoe.

CHAP. XXI.

ON THE PATTEN SHOE.

[See Plate III. fig. 1.]

The use of a Patten shoe is to raise one foot higher than the other when standing in the stable.

In cases of lameness, for any considerable time, either of the legs or feet, where probably the primary cause may have been removed, there is a want of action in the parts from a long previous state of relaxation; a shoe of this description is on such occasions found useful. To bring these parts into action this shoe is put on the sound foot, which raises the limb altogether, and so alters the position of the leg, that the horse can bear but little

weight on that foot, and is therefore compelled to bear more weight on the lame leg.

It is necessary to begin with this shoe for a short time, and to increase the use of it by degrees until it can be worn twelve out of twenty-four hours daily. Many clumsy and awkward contrivances are in use for this purpose, most of which are of a piece with the shoe; therefore, when it is put on, it must remain continually until the shoe is taken off again. The evil attending this is, that, on some occasions, the increase of pressure, which is continued constantly, is too great for the suffering limb to bear, and instead of being beneficial, when the shoe is taken off, the lameness is considerably increased. A great advantage is therefore obtained by making the patten moveable, which is effected in a simple way, and may be applied to any shoe which has been put

on for ordinary wear. The only alteration consists in having a screw hole made on the outside heel, the patten being made of a requisite height from two to four inches from the shoe, with three branches or legs forming an arch from each heel of the shoe; the inside branch fixed on the inner rim of the shoe by a claw; the front or middle branch advanced towards the toe of the shoe, where it fixes also by a claw; and, in the outside branch, a round hole opposite to the hole in the shoe, to which it is fastened by a screw.

The direction of the middle branch, where it is connected with the arch of the patten, should be attended to, as otherwise it may lock in the gratings of cesspools; the branch from the centre of the arch should be perpendicular for an inch or two to prevent effectually an

accident of that kind. In some cases of lameness, from an injury or inflammation of the joints, it may be useful to raise the heels of the foot to relax the limb during the state of inflammation. In these cases, turning up the heels of the shoe will answer the purpose. There are likewise other cases where the joints become diseased from the heels being elevated too much, and the weight borne on the toes; here it is necessary to elongate the toe of the shoe agreeably to the necessity of the case, observing that the elongated part is curved, otherwise it would do more harm than good.

CHAP. XXII.

ON SCREW SHOES.

[See Plate III. fig. 2.]

In cases of contraction it has been considered by some persons, that mechanical power presents a simple and easy mode of relief; but the advocates for such a remedy should have well considered the probable consequences of a screw applied to a part though not in itself sensible, yet firmly united with living and sensible parts; and that any immediate alteration in form, produced by the screw, must equally affect the sensible parts which are united to it. In this way I have seen serious injury produced. Though screw shoes are an old invention, they were revived a few years

back by a Mr. Jekyl. If the screw is judiciously applied, it is in some cases attended with advantage; it should never be attempted with thin or flat feet, as it invariably produces mischief in them; but where there is plenty of horn, strong and firm, it may be used with a better chance of success. During the progress of the attempt, a horse must be put out of work, his shoes taken off, and his feet well saturated with water some days previously to the application of the screw. Various contrivances of this kind have been recommended by different authors, most of which are ill calculated to answer the intended purpose. All, that have come within my observation, have a joint at the toe, with a screw at the heels, the head of which projects from the outside heel of the shoe; by this means the shoe is in continual danger of being torn off by

hitching on something, or being entangled in the litter. The shoe which Mr. Jekyl adopted was of this description, with as many nail holes as could be punched. A screw thick enough to answer this purpose without bending necessarily increased the thickness of the shoe to an unusual degree, and where one heel is more contracted than the other this shoe offers no means of applying the screw to either; and it is evident that the whole expanding power with this shoe is determined on the nails and clinches, which, on many occasions, tear out the piece before the object is obtained.

A shoe was suggested to me by Sir B. Bloomfield which obviates all these objections. It has two joints, one on each side of the toe, and is therefore made in three parts; a centre or toe-piece, which has two nail holes in it, and from the centre of this

a branch or flat piece of iron about an inch and a half in width (of the same thickness as the shoe,) which extends over the centre of the foot to the termination of the frog, on which it is intended to bear. As this branch approaches the wide part of the frog it increases in width and thickness in order to receive a circular hole through it, which is made into a female screw on each side. The sides of the shoe have three nail holes in each, with a claw on the inner corner of each heel turned upwards, which are fixed on the back part of the reflection of the crust or wall, and may be called the beginning of the bars. The two joints being completed, the shoe is put on, and as the middle division of the shoe is kept on by two nails at the toe, it affords a fixed point for the action either of the inside or outside quarter of the shoe, or both, as may be required. Two short screws are

necessary, which are applied in the female screws of the centre branch, and the opposite end of each acts in a small groove on the inside of the shoe at each heel. In a shoe of this description there are no projecting parts beyond the rim of the shoe, which is of the usual thickness, and having claws at the heels there can be no strain on the nails and clinches, and consequently no injury can be done to the crust during the application of it.

It is necessary that the hoof should be kept in a state of continual moisture; each screw to have half a turn daily, or every other day, as the nature of the case may require. Bleeding and physic are useful during this process, and a diluting diet, as it is not prudent to give exercise under this operation. From two to four weeks will be sufficient to obtain all the benefit

that this shoe affords. The expansion takes place principally in the centre or cleft of the frog; if it were at the heels or the quarters, in the same degree as in the cleft of the frog, more mischief would arise by separating the horny from the sensible laminæ than any advantage that could be gained by the use of the screw. On the first appearance of expansion in the frog, however diseased (with ordinary cleanliness, and the application of a few simple remedies recommended for the cure of thrushes), new horn soon fills up the diseased cleft, and in a short time presents a frog full of sound and strong horn. If the screws are not turned gradually, or if they are applied too long, it will produce great mischief. When the screws are taken off a shoe, similar to that I have recommended for general use, will prevent the heels from contracting again, which would soon

take place with the use of the common English shoe. Exercise should at first commence with walking, and increase by degrees. In cases where I have not had success in the use of the screw for the relief of contraction, I have noticed a deviation in the growth of the hoof at the coronet itself; and, as it descends, it wrinkles, and grooves appear; where they take place to any considerable degree, I have never seen any good obtained by the use of the screw. On the other hand, I have on many occasions seen benefit from a judicious application of it. As I have mentioned the use of a claw at each heel of the shoe, I may remark, that, as Mr. Coleman has obtained a patent for the adoption of it, he of course thinks its use important, and although I do not agree with him in the propriety of it for general use, I think it is important in a screw shoe, as it re-

lieves the nails and clinches from the pressure of the screw. Mr. Coleman has only revived the use of this contrivance; it is an old invention, as I have in my possession a shoe precisely on the same plan, which was introduced by Mr. Snape many years before the veterinary institution commenced.

I have considered it useful to give a plate, illustrating the state of a horse's foot, a cast of which was taken, (see Plate X. fig. 1.) in April, 1819. A cast of the same foot, (see Plate X. fig. 2.) was taken in October, 1819. Fig. 1. exhibits a mass of disease and deformity. Fig. 2. a foot by no means perfect, but greatly improved in form, and assuming a healthy appearance in all its parts. The horse is now (December, 1819) at work, perfectly sound, and efficient for any purpose. It may be

interesting to state, that the contrast was effected, first by the gradual application of the screw, during which time the foot was kept in constant moisture, by the use of the water boot, and afterwards, by following the plan of shoeing, and the method of managing the feet herein recommended.

CHAP. XXIII.

ON GRASS SHOES, OR TIPS.

[See Plate IV. fig. 1.]

The use of these shoes depends much on the season of the year, the state of the weather, and the situation where horses are turned out. In the months of November, December, January, and February, if the weather is open, shoes or tips are quite unnecessary; but, if the ground becomes hard from frost, a defence is proper; otherwise the crust will be broken in some places, and split in others; or if the situation has a number of trees, horses continually break their feet by pawing and scraping against the roots; or if there be much gravel about the shed doors or gateways, they break their feet from that cause.

I have invariably observed, where horses are turned out to grass during the dry and hot summer months, that, on bringing them up to be put into stable condition, their feet are in a much worse state than they were when they went out; dried up, and so hard and brittle, that, on the application of a tool to bring them into a form fit to receive a shoe, the horn breaks like a piece of glass, and all the naturally tough and elastic property is lost, so that it requires some months to remove the bad effects. If it is necessary that a horse should be put out of work during the dry and hot weather, I prefer a large box or shed, and soiling with green food, by which means two objects are gained, viz. all the injurious effects of a drying wind or a meridian sun on the hoofs are avoided, which creates such an excessive evaporation of the natural moisture absorbed into the horn from

within, that it not only becomes dry, hard, and brittle, but the whole horny box tightens on the sensible parts, and frequently produces great mischief. But in a loose place moisture may be applied in any desirable way. The other advantage of a shed or box is, that horses are in a great degree sheltered from the terrifying effects of flies and heat. Horses at grass are much inclined to thrushes, the cause and treatment of which may be referred to under that head. Whether horses have shoes or tips, or are without either, it is necessary frequently to inspect their feet, and to remove all the superfluous horn, otherwise the hoofs will get into a state of exuberance, and grow out of form. A defence is only necessary for the fore-feet.

CHAP. XXIV.

ON SHOES WITH MOVABLE TOES.

[See Plate III. fig. 5.]

WHERE horses are required for daily service, or are unusually hard wearers, a contrivance of this kind is necessary to prevent the necessity of renewing the shoeing too frequently. It is obvious, that when horses are fresh shod, on an average, every ten days, which is nearly the case with those that work daily, no hoof, however strong or firm, can bear it without inconvenience; with thin and flat-feeted horses ruin and destruction follows, as the horn is consumed much faster than it grows. It is desirable that shoes should remain on from three weeks to a month; but if horses are shod three times in a month instead of

once, they are shod twenty-four times in a year oftener than they ought to be. It is thus clear, that the most perfect feet cannot bear this repeated perforation of the nails, and on this account I consider that a shoe with a movable toe, is on some occasions necessary ; but where shoes can be kept on from three weeks to a month, they are not required. When the shoe is made, it should be thinned at the toe gradually, until it is about the thickness of a half-crown, leaving a bur of a semicircular form on the inner rim about the centre, to be the fixed point for the movable toe-piece ; a flat key-hole must then be punched through this bur on a level with the shoe. The movable toe-piece is of a semicircular form, tapering from the centre each way, and in the centre of the moveable piece is a tongue, on a level with the shoe-side of the piece, and about half its thickness.

This piece and tongue are forged in a tool; when fastened to the shoe the tongue is put through the key-hole in the bur, and rivetted on the inside of the shoe; a thin collar on the tongue before rivetting facilitates the removal of the toe-piece when necessary, which is easily accomplished with a small chisel made for the purpose. When the shoe is complete, there is no inequality in the thickness of the shoe, which is the same from toe to heel.

I have ridden and driven horses many thousand miles, renewing the toe-pieces when necessary, without stirring a nail, which enabled me to keep the shoe on the foot a proper time, and until the hoof wanted paring. It may be objected that these shoes will be considerably more expensive than the ordinary shoe. The first sets are undoubtedly so, but when it is

considered that the wearing part is movable, and that all the remaining parts of the shoe will last from six to twelve months or more, the expense will be principally in substituting the wearing part. Admitting that the expense is more than common, the advantages gained are more than an equivalent to the expense. There is another important advantage in the adoption of these shoes in proceeding on a long journey. In the first place you are not detained on the road every ten days to get fresh shoes put on by a fresh smith; in the next place, when the feet want paring, your shoes are already made, and as you have proved that they fit the foot, to rasp the crust and remove any superfluous parts, and nail the shoe on again, is all that is required.

CHAP. XXV.

ON THE HUNTING SHOE.

[See Plate II. fig. 5.]

THIS is of the same principle as any other shoe; nevertheless, it is proper to attend to a few remarks. A shoe for common road-work would be too heavy for hunting; it is therefore necessary to make them narrower and lighter altogether; they should, however, have substance enough to prevent bending in wear, and they should be put on as near the sole as they can with safety. A good criterion of the distance is to admit a small picker freely between the foot and the shoe all the way round to the nails; if there is too much space between the foot and the shoe, in going through deep clays

it creates a sucking property which tears the shoe off. The heels of the shoe should not be too long, as in that case they would be frequently torn off by the toe of the hind-shoe ; but they should be as long as the horn, otherwise, from being short, they would soon be imbedded into the foot and produce mischief. It is a practice to turn up the outside heel to prevent slipping. So long as the ground remains moist this does no harm, as the ruff sinks into the ground and brings the foot on a level ; but in frost or going over hard roads, the foot is turned on one side, and produces mischief ; this may be obviated, in some degree, by lowering the horn of the same heel. If shoes are made as concave on the ground surface as the nature of the foot will admit, my opinion is, that ruffs are seldom necessary. The curve at the toe of the French shoe is objected to by some persons as not

affording sufficient security from slipping. My answer to this objection is, that when a horse is at speed a curve offers a surface for pressure, whereas in a shoe straight from toe to heel, when the action of the foot is finishing, and leaving the ground, there is only one point of bearing, which, after a little wear, is a quick slope, and by no means equal to the surface of bearing, which the curve presents. I therefore consider that a French shoe is more calculated to obviate slipping than an English shoe, and when we see a curve so general in almost every country but this, it is in my opinion strong evidence in support of its security.

To show how far prejudice will go, I will relate the following case. A person undertook a journey in the summer of 1818, with a horse and buggy; the horse being pre-

viously shod with a set of shoes on the author's principle: after a journey of between three weeks and a month, through Lincolnshire and many parts of Yorkshire, he returned to London. Asking him how he liked the new plan of shoeing, he said he had nothing to say against it, as his horse had the same shoes on, and every nail in their places, as put on in London, and that he had not had occasion to go to the smithy to have a fresh nail, or a clinch tightened. Making further remarks on the advantages of such a plan, he observed, that after all, there was nothing equal to the old plan, and that he was sure a horse would slip with the new shoes. When asked if that had happened during his journey, he replied, "No; but then you know I travelled over turnpike roads." I then enquired if he had never observed horses slip with the old plan of shoeing: he replied, certainly.

To this I observed, that as slipping was so common an occurrence with the old plan, if a horse slipped and fell, no remark was made as to the probability of the convexity of the old shoe being the cause, and that it was therefore considered as an unavoidable circumstance, and no more thought about it.

The toes of the hind-feet shoes should be bevilled, sloping inward, and set rather within the horn of the hoof, which should be rounded to the shoe; by this means over-reaching and forging will, in a great degree, be prevented. It has happened that the fore-feet shoes have locked in the hind-feet shoes, and when this occurs, the horse invariably pitches on his head. I recollect a mare of Lord Maynard's, that fell in this way, when one fore-foot was so completely locked in a hind-foot shoe,

that it was necessary to use tools to extricate the animal from so awkward a situation. If the inward edge of the hind-feet shoes are bevilled and rounded, this accident cannot take place.

CHAP. XXVII.

ON THE RACING SHOE, OR PLATE.

[See Plate IV. fig. 2.]

It is material, that plates should be made of the best Swedish iron; as that will stand the groove and punching better than English, and is not so liable to break. In general, I think, plates are made rather too slight; they should have substance enough to prevent bending when used. They are forged in a tool made for the purpose, and if the groove was made further from the outer edge of the plate, the nail-holes would consequently be punched further in, by which means the nail might be driven in the same direction as the French recommend. A flat surface on the foot side is

generally used, which answers very well; and it is proper to adopt the same form in the plate, as in the shoes intended to be put on after the removal of the plates. For instance, if parallel shoes are put on when the plates are removed, the plates should be parallel also; and if the horse is wearing a shoe curved at the toe, the plates should be curved also. Three or four nails on each side, according to the size of the foot, will be sufficient, and the heels of the plate should not be longer than the horn of the heels, but a trifle shorter, to avoid being torn off by the toe of the hind-feet. As plates remain on the foot so short a time, a particular form is of little importance, as far as regards the effect on the foot. All that is necessary, is to drive the nails, which should be of the toughest quality, safe, and to avoid pressure on the sole. There is a practice occasionally to

cut pieces of old hat or leather the precise form of the plate which is nailed on between the foot and the plate; but I could never discover any advantage in this, but rather the contrary, as the plate under such circumstances is by no means so safe or secure on the foot, as it is without it.

I have often lamented, that race-horses are deprived of the great advantage of being taken to a forge to be shod, which is the only place where a horse can be shod with accuracy. I have, on many occasions, observed smiths bring shoes or plates that were far from fitting the foot, and alter them by a blow or two with the nailing hammer on a stone or the pitching, which is considered sufficient; and any deficiency in fitting after that is made up by removing a part of the foot, which, if the horse had been shod at a forge, would have remained

on. Hence race-horses and hunters, which are shod in the stable, are more liable to the destructive practice of fitting the foot to the shoe, than any other class of horses. Mr. Cherry, an ingenious Veterinary Surgeon, has taken out a patent for a portable forge, which, I think, would be useful for all trainers or gentlemen to have on their premises for the use of the smith that attends their stables.

CHAP. XXVII.

ON FULLERING.

Shoeing smiths apply this term to the groove in the outer edge of the ground-side of the shoe, which is generally continued all round as near to the outer rim as the iron will admit; but in some instances it is made deeper, and is not carried round the toe. In the bottom of this groove the nail-holes are punched.

The object of this groove is to receive the nail-heads, but in general it is too superficial to answer this purpose; when a counter-sink head is used, the groove is made deeper; but the inner edge of the groove is perpendicular, and the outer edge

slopes towards the exterior rim, to give the point of the nail a slanting direction inward. It is considered, that the smith who can keep this groove nearest to the edge of the shoe is the best workman, and it is by them denominated fine fullering.

If this groove is cut deep into the shoe, it is evident that it must weaken it, and if the iron is not good, it will crack in the outer edge of the fuller, and if it is superficial it affords no security to the head of the nail, and if made with accuracy, and deep enough to afford security to the head of the nail, it is a tedious process, and takes up much time. The fuller, or groove, has been recently altered at the Veterinary College; it is now carried further into the shoe, and is similar to the German method of making the groove, which gives an advantage in taking more hold, by driving the

nail through a portion of the sole on the inside of the crust similar to the French method of nailing.

Some persons have fancied, that by making two or three grooves round the shoe, slipping would be prevented; it does not, however, appear to be well founded, as such a practice is rarely seen.

CHAP. XXVIII.

ON PUNCHING.

The ordinary English punch is square, and slightly tapering, and is made more for the purpose of getting it readily out of the shoe when the blow is given, than for the security that the form of the hole may give to the nail. It is applied in the centre of the fuller upon the depth of which the punched part depends. The nail hole is as wide, or nearly so, on the foot side of the shoe, as it is on the ground side; the smith who brings the nail hole on the foot side of the shoe nearest to the exterior edge, is considered the best workman.

It must be obvious that a hole of this form affords little security to the nail. Burs

are not unfrequently left on the foot side of the shoe, from the smith having omitted to remove or flatten them after punching; which sometimes produces mischief.

The holes of the Persian, Turkish, and Barbary shoes are punched round, but not near the edge, as they have no fuller. The German, Dutch, and Russian shoes are punched in the bottom of a coarse fuller. In the Portuguese method, the hole is very large, oblong, and square, extending far into the shoe, and is peculiar to themselves, and without a fuller. In the Spanish, Flemish, Italian, and Swiss modes, the punch hole is similar to the French.

The French hole I consider to be much the best, and it, in my opinion, possesses some important properties, but it requires two punches to form it perfectly; the first

a small common counter-sink punch, which is struck nearly through the shoe, leaving only what is necessary to be opened by the pritchel; every hole having been opened in this way, a large and deep counter-sink punch is then used to every hole, which must be struck nearly as deep into the shoe as the first punch, to admit the counter-sink part of the head of the nail to be buried in the shoe.

Much depends on this last punch being driven deep enough; if it is not so, a shoulder will be formed in the hole by the first punch being much smaller than the second; in this case the nail head, instead of being sunk deep into the shoe, will stand out; consequently it will not have sufficient security, and the shoe will be more liable to come off.

Perhaps there may be a little advantage in sloping the inner square of the hole rather more than is done in the French method, to obtain a greater degree of obliquity to the point of the nail. The bottom of the hole is pritchelled in the usual way, only with this difference, that it is made to receive a flat instead of a square shank, and to be as near the size of the shank intended to be driven as possible, that the nail may fit and have a direction outwards. Instead of following the French in their number of holes, which is eight, I use seven, four on the outside, and three on the inside; this leaves the last hole of the inside at a greater distance from the heel than the outside, where they are carried much nearer to the end; and instead of carrying the nails all round the front of the foot, I prefer leaving a solid space at the principal point of wear at the toe.

On looking at the foot side of the shoe, the nail holes (unlike the English, which are very near the outer edge) extend a considerable distance into the interior part of the shoe, the use of which will be explained in the chapter on nailing.

If the quality of the iron is not good, it will be put to the test by the application of the punch ; it will either burst on the outer part of the hole, or cracks or flaws will be seen ; neither of which will appear if the iron be good.

CHAP. XXIX.

ON FROSTING.

Frosting, like shoeing, is a necessary evil, but the inconveniences attending it show themselves much sooner than the effects of ordinary shoeing.

In order to avoid wounds by treading one foot on the other, it is the practice to turn up the outside heel only: it is thus so much raised, that it turns the foot on one side, and brings on an unusual strain on the ligaments of the joints, which often produces lameness. The toes of saddle horses are seldom frosted, therefore an unusual elevation of the heel, either by one or two frost ruffs, alters the tread so much, that it increases the action of some, and diminishes

the action of other muscles accustomed to strong exertion; it is also manifest that a considerable increase of pressure on the heels would follow, so that lameness frequently attends the practice of frosting, even for a short time. The ordinary method of frosting, is by taking a shoe off, heating the heels or toes, and turning them up ruff; but this being iron only will last, for any efficient purpose, but a short time; and the same process must be repeated, perhaps daily, as long as the frost lasts. It is evident the hoof must suffer most severely by such a continued and repeated perforation with the nails, so that if a frost should last a month or two, it is probable there would be scarcely horn enough left to nail a shoe on with safety.

When frosting is required, I have found by steeling the heels, and if a draft horse

the toes also, that they will last considerably longer, and consequently diminish the frequency of driving nails. A much shorter ruff also will answer, and the usual tread will not be so much altered. A ruff on the outside heel is sufficient, if on feet where horn abounds, and the horn of the same heel may be removed or lowered with safety, to counteract, in some degree, the depth of the ruff; but as with thin feet, and weak low heels, it is not practicable to remove horn, a bar shoe, with a ruff on the centre of the bar, is desirable, or a short ruff on both heels, observing to round the corners of the inside ruff, to obviate the effects of treading one foot on the other. Frost nails are frequently used, but the time they last is so short, that the practice is injurious; but if they are on an emergency resorted to, the head of the French nail presents a considerable substance for

that purpose, but the common English nail very little.

Many persons have suggested to screw in the ruffs. I have tried screws in all feasible forms for this object, but I have never found that any screw would remain firm enough to answer any good purpose. The most efficacious method of applying a removeable ruff (Plate III. fig. 6.) is to make a short square turn-up at both heels of the iron only, through which punch a square hole to receive the shank of a steel ruff, which is rivetted at the end of the heels, leaving the steel ruff in the inside of the iron ruff, about half an inch higher than the iron ruff. A steel ruff may be rivetted at the toe when required, in the same way, observing to rivet the shank on the outside of the shoe. To take these out, a few strokes of the rasp will remove the

bur of the rivet, and by a trifling blow with a shoeing hammer it will come out. The steel ruffs should have iron shanks, and are easily made in a tool for that purpose. The use of removable ruffs for ordinary purposes, perhaps, may be considered tedious and too expensive, but in a country like Russia, where the frost continues regularly for many months, a previous preparation for the winter, would, I consider, be attended with great advantage. The application of ruffs for any considerable time produces corns, and alters the natural form of the heels of the hoof, especially if they are thin or flat, by inclining them to an oblique shelving direction forward.

CHAP. XXX.

OF NAILS.

[Plate IV. fig. 5, 6, 7, 8.]

The inconvenience and danger occasioned by casting shoes are too familiar to every horseman to require any comment. Sometimes a shoe may be pulled off by accident, but the causes may be principally attributed to the rottenness, together with the bad form of the nail. The first consideration should be the quality of the iron; if it be too brittle, which may be ascertained by bending a nail once or twice, the nails soon break: in endeavouring to point them, as it is termed by the smiths, the fibres split, the nail appears somewhat hollow, and is of no use; the number of nails wasted in ordinary shoeing forges, on an

average, amounts to one-third. If we consider this as general before shoeing, it cannot excite much surprise that the shoes are continually coming off. This inconvenience might be very easily avoided by smiths, if they chose to have it otherwise.

The form of the ordinary English nail is ill adapted to answer the intended purpose, as it has a small head with an abrupt shoulder, a square thick shank three-fourths of its length, and the remainder flat, thin, and often too weak, even to bear driving through the horn ; the head usually stands out of the shoe; as the groove or fuller in the shoe, in which the nail holes are punched, is so superficial as not to admit the head to sink into it, the nail head therefore soon wears or breaks off, and as the shoe has but little purchase on the remaining shank, from the nature

of the hole, the shoe soon comes off. The square thick form of the shank also ill agrees with the intended purpose; as it is the practice in all English shoes to drive the nails into the crust only, which in about one-half the horses is very thin. This form of the shank is calculated to produce compression on the sensible parts, but to obviate this, smiths, when pointing their nails, hammer the square part of the shank on the nail stake until it becomes flat and sufficiently thin to admit of its being driven with safety; but this endeavour to remedy the improper form of the nail produces another inconvenience, which facilitates the loss of shoes. Those, who are acquainted with the nature of metals, know that the hammering required to flatten the square shank compresses the fibres of the metal so closely together, and stiffens it so much, that it brings it to a state approaching to

hardened steel; a slight blow or the ordinary concussion of action is sufficient to cast the shoe, when the nails, being all broken off just below their heads, leave the shanks in the hoof; and when the flat part of the shank is too thin in proportion to the thickness of the other part, all the endeavours of the smith to bring this thin part of the nail into a proper form, or stiff enough to drive, is unavailing, and hence arises not only great mischief to the foot, but also a great waste of nails.

A nail with a counter-sink head has been recommended, and as far as the head is the object, it is better than the common one; but to the remainder of the nail, in all that I have seen, there is the same objection as to the common nail.

The Persian nail is peculiar and is unlike any other, having a raised head,

with an abrupt shoulder all round, and is beat out at the shoulder into three points, which are somewhat flattened: the shank is small, square, and taper. By this peculiar form the nails are locked together. After the first is driven, one of the flattened points of the next rests on the first, and so it is continued until the whole are driven; so that as long as the last driven nail remains firm, the others cannot be displaced. There may be an advantage in this respect, but I fear an inconvenience would attend it, which might overbalance the utility, viz. that if it were necessary to remove a nail betwixt the periods of shoeing, this could not be well accomplished without taking out others; and should it happen to be the first nail driven that is required to be taken out, the whole must be removed before this could be unlocked from the adjoining nail.

Turkish and Barbary nails are similar to the Persian, with the exception of the locking property. The Portuguese have a thick square head, and the upper part of the shank is appropriate to their peculiar nail-hole; but the shank tapers to about half its length. As it is the practice in that country to allow the crust to descend far below the sole, the square thick shank approaching the head can do no harm. Spanish, Flemish, Italian, and Swiss nails are inferior copies of the French. The German nail has a flattened head on two sides, rounded in the centre to its shoulder, and is not much dissimilar to the English, only that it has a shank broader and flatter. The Dutch and Russian nails are a clumsy copy of the German.

The French nail has a large square counter-sink head, which is received into a cor-

responding hole in the shoe, into which it sinks more than three fourths of its thickness; a part of the head remains below the level of the shoe, and is flattened on four sides, leaving the centre of the head convex and pointing. The shank is flat, broad, and regularly tapering to its point; in short, it is similar to the tire nail, with the exception of a flat instead of a square shank. The nails should be of different sizes, agreeable to the size and state of the foot.

Having described all the nails used in shoeing, which have come to my notice, I now offer some remarks on their comparative merits; but more particularly between the English and the French. The latter I consider to possess far superior properties over any other. The large, deep, countersink head, as long as the shank remains sound, affords a security to the shoe while

a bit of iron is left on the foot; but when the English head is worn off, which soon takes place, the shoe is no longer safe. Another security afforded by the French head is, that it is firmly supported by the four sides of the counter-sink hole; the English, by two sides only, and very superficially. The shank of the French nail being broad, flat, and taper, does not require the hammering before spoken of as so prejudicial; it therefore can be driven into the hoof with all the natural and genuine properties of the iron, requiring only to be straightened, and stiffened a little at the point; but none of this stiffened part remains in the foot when shod, as that is twisted off by the pincers, and clenched on its appearance through the hoof.

As the head of the French nails take a little more time and iron, it is reasonable

to allow that the manufacturer should charge more for them ; but when the trifling waste is considered, there will be very little difference of expense between them and the common nails.

Having had much difficulty in procuring a good and efficient nail, it is only just to Mr. Watson, of Belper near Derby to say, that he has given me great satisfaction in the manufacture of these nails.

In the choice of iron for this purpose, I believe the Russian which is brought from Archangel is the best, and it should possess the properties of malleability and toughness : a good nail of a fair quality will bend backwards and forwards from eight to twelve times or more, before any evident marks of breaking appear on the bent part; if the iron be not good, it will crack and break at three

or four turns, and split in pointing. Swede iron, from the superior strength and body of metal, seems to offer great advantages; but smiths in general prefer the best Russian, because they think that the former, though sound and strong, is too stiff for the manufacture of horse nails.

CHAP. XXXI.

ON NAILING.

NAILING is an important part of the art of shoeing, and deserves mature consideration, as upon it very much depends whether a horse goes sound immediately from the hands of the smith. From a defect in its principle, nailing contributes to the production of those permanent diseases so frequently spoken of. If lameness is caused by a direct stab, it will be seen instantly, as it arises from taking too much hold, pitching the nail inward, and at the same time driving too high in the crust; or from the point of the nail splitting, and taking a contrary direction to what was intended.

In other cases where the injury is not

severe, and where the nails are driven too near, and press on the sensible parts, lameness will not show itself so soon; and the time of its appearance after shoeing will be in proportion to the degree of pressure. In all cases of lameness, where there is no particular external indication, it is prudent to take the shoe off, when, if it proceeds from the effects of a nail, it will soon be discovered; the usual remedies to counteract inflammation will succeed in these cases. Collections of matter on some occasions are found, and produce troublesome ulcers, difficult to heal; they are, however, only of a temporary nature. It must have been observed, from the ordinary fuller being made too near the outer edge of the shoe, and from the manner of punching the holes in the fuller, that the nails are intended to be driven into the crust, and Mr. Coleman observes, that, so long as nails are

made of iron this must be the practice; nevertheless, it is not so at the College now. It has, however, been productive of great mischief, inasmuch as it has a tendency to break down and destroy that defence which nature intended to protect the internal sensible contents of the hoof.

When the diameter of the crust is considered, even in perfect hoofs, and compared with the diameter of the shank of the ordinary nail, it cannot excite surprise to see the hoofs of horses split and mutilated in the manner they are; but when it is considered that one-half of the feet of horses are defective in the natural production of horn, and have consequently a thin crust, this mode of nailing must add considerably to the number; and as it has been shown by the nature and direction of the hole, that nails must be pitched inward, and as the

hole is so near the outer edge of the shoe, the nail must necessarily be driven a considerable height in the crust, to get hold enough to afford the shoe the necessary support; and the nail having been driven inwards, it must, in the course of its direction through the hoof, before the point comes through, have taken a curved direction, when the curved part being the nearest to the sensible contents, it must more or less have a tendency to press, in proportion to the degree of curve and approximation, on the sensible parts.

Much depends on the proper size of the nail. I have on many occasions seen smiths, for want of a proper assortment, drive large clumsy nails into small delicate feet, and on the other hand, small feeble nails, not large enough to fill the clumsy holes of a heavy shoe, for a large foot. The nail-holes

are generally too near each other; so that the frequency of driving nails so near together, renders that part of the crust a mere shell, full of holes: and the difficulty is great, which smiths frequently meet in finding even a sound piece of horn to drive the clinch through. It is not unfrequent to observe a smith drive a nail half or three-fourths of the way, then pull it out again, get a fresh nail, give the point a new direction in search of a bit of sound horn to drive some part of the nail in, and repeat this driving and pulling out again eight, ten, or even twelve times, before he considers the nail safe; and it is by no means an uncommon occurrence when shoes are taken off, to find where the nails have perforated the crust in the way described, the whole piece come off with the shoe as high up as the clinches. The consequence of such a breach in the wall may be readily

imagined, the smith is obliged to look to the remaining part of the crust, where it has not been usual to drive nails, to keep the shoe on by any means, he is therefore driven to the toe and heels, or indeed any part of the wall, where he thinks he can get a nail in, and when the manner in which the weight of the horse is bearing (only on an extreme edge of the shoe) is considered, there must be an unnecessary strain on the nails and clinches, and consequences, like those mentioned, are unavoidable. As I have already stated that a breach in the wall on one side the hoof is frequent, and as it sometimes happens that both sides of the foot are torn off in this way, the toe and back part of the heels are then the only remaining parts where a nail can be driven, and the weight of the animal is thrown on these two points; it may thence be readily imagined that he will not work

long in this state; a run at grass for several months will be necessary to restore this loss and waste of horn. It is, however, probable, that so much mischief has been done to the foot, that a run at grass will not remove the consequences, and that some permanent disease has taken place.

In the ordinary manner of nailing, we either see the nail-heads standing far out of the shoe, or the head is so small, or has been so rasped by the smith to bring it more on a level with the shoe, that a few days will wear it off. Mr. B. Clark prefers the common to the counter-sink head, believing that it leaves a degree of room between the shoulder and the shoe for the expansion of the hoof. I confess, I should not like to commence a journey if there were any play between the shoe and the foot, as it must be quite clear a shoe under such circum-

stances could not remain on long. In the seated shoe there is not that strain on the nails and clinches as in the common shoe; for the crust, instead of bearing on an edge, is opposed by a flat surface; but as the nails are pitched inward, and driven into the crust, the same destruction of horn takes place with this as with the ordinary shoe. Grooms and coachmen have a practice of taking their horses to the forge between the periods of shoeing, or to require a smith to attend every Sunday morning to knock down and tighten all the clinches, and to renew nails. The starting of the clinches arises from the shoe getting closer to the foot after it has been on a short time; and as the bearing is only on the outer edge, it imbeds itself in some degree within the crust; thus the distance between the nail-hole on the foot-side of the shoe and the clinch must be

shortened, so as the shoe gets closer to the foot, the clinches are pushed further through the hoof, which produces the starting of the clinches, which invariably attends the English manner of shoeing.

It sometimes happens that a clinch is not pushed further through the hoof, but has started on the ground-side between the head and the shoe, whence it becomes loose and no longer performs its part in retaining the shoe on the foot. It is obvious that any plan of shoeing, which produces a starting of the clinches, must render the shoe very insecure on the foot; for the moment the clinches begin to start, the only remaining support is afforded by the shank alone; and should the shank have been driven through horn already split and shelly, it will account for the number of cast shoes which are perpetually seen. It

is too much a practice with smiths to make a nick in the hoof with an edge of the rasp, under every nail, previous to turning the clinch; this is done to let the clinch within the hoof, and to give it a finish: but it is a bad practice, as it much weakens the hoof. It may be necessary to remove any rough part which the nail may have forced through the horn, but to give the foot a finish the rasp is too liberally applied to the clinch itself, to weaken it until it is on a level with the hoof; the part of the hoof between the shoe and the clinches never fails to receive this finishing stroke, which is very injurious, as it diminishes the thickness of the crust. It may also be necessary to round the bottom edge of the crust to the shoe, but that is all which is required.

Having described the imperfections of all the plans of nailing that have come within

my observation in this country, I shall now explain a practice which appears to me to obviate those inconveniences. The French method has some properties admirably calculated to answer a better purpose, for instead of driving the nails into the crust, a greater hold is taken, as the manner of punching the hole indicates; the nail is driven within the crust, consequently going through a portion of the sole, it takes a short oblique outward direction through the crust, which is the reverse of the English plan, as has been shown: their nails have an inward direction. By taking so much hold, and giving an oblique outward direction, the smith is enabled to bring the clinches much lower in the hoof, and nearer to the shoe: this direction of the nail affords a much stronger hold of the foot, and is less liable to split the crust.

An English smith, on a first view of the distance that the French punch their nail

holes from the outer edge into the shoe, decides, that they cannot be nailed on the foot with safety ; a little practice, however, proves that it is not only a safer, but a far more secure method. What is here said has a reference only to taking more hold, and directing the nail obliquely outward.

I have already mentioned, that I consider the foot side of the French shoe objectionable, as far as relates to its concave form, which must produce an unnecessary strain on the nails and clinches by resting on the outward edge of the shoe, causing the clinches to start, and to produce all the bad effects occasioned by their starting.

The shoe which I have adopted obviates these inconveniences, and I cannot adduce a proof more convincing of the truth of this than that on an inspection of the feet, when

horses are brought into the forge to be shod afresh, I have generally found the clinches firm in the hoof and without any appearance of starting, which I consider to arise from the plane of the shoe inclining outwards, and embracing the crust so firmly at first, that it does not admit of any alteration in the distance between the shoe and the clinch during the time of wear.

It therefore appears that the following important advantages arise from the French method of nailing, viz. preservation of the wall or crust, and a more secure retention of the shoe on the hoof, and when combined with the alteration in the form of the shoe, which I have adopted, it is calculated to prevent contraction, and compression of the sensible parts within the hoof.

The facility with which smiths nail on these shoes when fitted, is not one of the

least advantages of this system. All the smiths that I have met with state, that after a little practice they can nail on three of these shoes with more ease, and in less time, than two of any other form, and it is a rare occurrence to see a nail wasted. Indeed the preservation of the crust by the short and oblique hold, and the security with which shoes are kept on, at once indicate all these advantages, and also that at every period of shoeing the hoofs have grown sufficiently to afford sound horn to drive the nails through, as well as the great security that the large and deep counter-sink head forms with the shoe.

I do not consider it necessary to say more on the method of nailing on the shoes of different countries, as I have before noticed that they all partake more or less of the French method.

CHAP. XXXII.

PAVING STALLS, GRATINGS, &c.

As this is a subject so intimately connected with the welfare of horses' legs and feet, I consider it necessary to offer a few remarks on it. The most remarkable feature in the paving of stalls is the extreme unevenness of their surface, but more particularly in a rise from behind to the manger, leaving a quick slope from before to the back part of the stall. It may be considered that this quick rise was intended to carry off the urine more readily, and this may have been the reason in many stables, but there are others, more especially with dealers in horses, where the pitching is raised to an extreme degree with a view to set off their horses to a great advantage, by making

them look larger and higher than they really are.

It is by no means unfrequent to find a rise from four to five inches, and I believe, on an average, it may be six or seven inches. If we consider the effects likely to arise from the unnatural position in which the horse is compelled to stand with his toes up and heels down; the unusual strain on the muscles of the back part of the leg, and the ligaments of the joints, particularly those connected with the foot; and that the animal, when in a stall paved thus, is compelled to stand with his hind legs extended or stretched out, we may readily believe that it is productive of serious mischief. In some instances there is a cess-pool in the centre of the stall to receive the urine, and to admit it to run readily the paving slopes every way round this

grating, so that it leaves the centre of the stall of the form of a basin. Besides this great unevenness of the stall, the urine, being stagnant in the cess-pools, is continually filling the stable, by its evaporation, with foul air and nauseous smells.

To remedy these inconveniences, it is necessary to observe in paving stalls, that it is more congenial with the natural state of the horse to have the paving lower before than behind, not only to allow them the power to get up with more ease, but to leave the muscles and ligaments of the limb, when standing, in a comparative state of relaxation. This may be effected in a simple way; instead of paving the stall, the greater part may be a grating, and if of cast iron the expense will be moderate. It may be in four divisions, and made to open and rest in the centre

on a ridge of stone. Under the grating may be two drains composed of stones on an inclined plane, which will readily throw off the urine as it falls into an outer drain. These inclined planes might also be made of cast iron; let the urine fall where it may it runs through this grating and out of the stable instantly, and the litter is kept comparatively dry. It is necessary to observe, that the bars of the grating should be close enough together to prevent the caulkings or ruffs of the shoes locking in between them, as in that case a shoe might be torn off: a little precaution in the form of the caulking may be necessary, which is to leave it the width of the shoe, and round at the corners. A stall of this description, one inch and a half lower before than behind, was put down under my direction, it has been in use five years, and answers all my expectations. To those, however, who

may not choose to go to that expense, a stall paved with Dutch clinkers, without any cess-pool, and a rise of an inch and a half, but not to exceed two inches, will be found more useful than the ordinary mode of pitching. To keep the air of stables sweet, from the continued effects of the volatile exhalations of urine and putrifying litter, various simple plans might be adopted with success; such as to let in a current of water through a pipe of from one to two inches in diameter into an under drain for a few minutes every day, which would effectually scour out all filth and smells. Some attempts have been made to pave stalls with cast iron, but as yet I have not heard that it has succeeded; I have, however, no doubt but that it will eventually be brought to answer for this purpose.

In some countries wood is used for stable

flooring, which soon becomes saturated with urine, and consequently adds to the volatile exhalations already spoken of, and forms also a sub-bed for the collection and lodgment of filth, which is continually emitting foul air. I therefore consider wooden flooring extremely injurious.

CHAP. XXXIII.

ON THE MANAGEMENT OF FEET IN THE STABLE.

In the preceding pages of this work I have frequently noticed the great advantage of a due degree of moisture being applied to the hoofs of horses when under stable management. It is familiar to every person who has paid any attention to the nature of horn, that it readily absorbs water, and that a few hours' immersion softens and renders it very pliant. When subject to the heat of stables and fermented litter, evaporation takes place so freely, that not only the little moisture which may have been absorbed during the day when at exercise or work in wet weather is quickly evaporated on returning into the stable; but also a great portion of the moisture

which has penetrated the hoof from within. Thus, if no means have been devised to counteract these effects, hoofs soon become hard and brittle, usually denominated stable-dried, and if under the influence of ill formed shoes, mischief frequently follows. It is therefore an object of great moment to bring horses' feet, when in the stable, as near to a state of nature as can be accomplished without much inconvenience. For this purpose I recommend two pieces of Bath coating, or any other coarse cloth, cut to the precise form and size of the hoof, and stitched together, with a leather lace at each end long enough to go once or twice round the foot (this I call a swab, see Plate VII. fig. 2.) It should be made quite wet, and be tied round horses' feet when dressed and clean. I also fill their feet with crushed linseed mixed with water, and made of the consistence of stiff mortar. At the last stable

hour the swab should be made wet again, and it will be found moist the next morning. In this way the feet of horses that are required to work, are kept moist and cool. I have found most advantage in using crushed linseed without any of the oil being taken out of it, as a foot stopping, in preference to any other, as it retains its mucilaginous moisture much longer than any thing I have seen used. I had some difficulty in procuring this article genuine, and properly crushed, but Messrs. Oldfield and Bentley, Little Queen-street, drug-grinders, having erected some machinery for that purpose which answers perfectly well, I have no longer any difficulty.

Cow-dung is used by many as a stopping, but as it soon gets dry in the foot, and has a strong tendency to destroy the texture of the frog, I object to it as a stopping.

Clay is also much in use as a stopping, but I have observed, after long trials, that it has a peculiar tendency to stop the secretion of the horn. The manner in which it produces this effect appears to be, that as it is a conductor of moisture for a short period only, and being dry, the remainder of the time that it is in the foot, it is then absorbing not only the moisture it conveyed, but the moisture also which penetrates the horn from within. I therefore object to it as a stopping.

I have found great advantage by stopping thin flat feet with an equal quantity of tar and hogs-lard melted together, and put in cold. I find that it promotes the secretion of horn when the hoof is well saturated with it, more than any other thing I know; and at the same time maintains the tough

and elastic property which is so very desirable.

I have frequently heard shoeing smiths observe, that there was more horn to remove at one shoeing when this stopping was used, than from the same feet in a year when stopped either with clay or cow-dung.

As the linseed stopping also promotes the secretion of horn, I on some occasions stop one week with the tar unguent and the next with linseed. Where there is plenty of horn the tar unguent is unnecessary. To preserve the tough elastic property, I have adopted, with manifest advantage, the practice of applying the tar unguent to the crust or wall rubbed in with the hand twice a week. Previous to stopping the feet with linseed, which is done

daily after work, I direct a small pledget of tow, saturated with the tar unguent, to be pushed into the cleft of the frog, and I find that this makes the frog proof against filth or moisture, and has the same effect on the horn of it as curriers dubbing has on leather. Some persons have objected to the tar unguent for stopping as being too hot for the feet, others as too softening, both of which notions, however, have originated from want of more experience.

If an increased production of horn is not required, perhaps the marsh-mallow ointment may answer a similar purpose as an external application to the crust or wall, but not to the base of the foot or the clefts of frogs.

CHAP. XXXIV.

OF THE CUTTING SHOE AND BOOT.

Cutting or striking one leg with the other is not always the consequence of a defect in the make and shape of the limbs, but is often produced by shoeing alone. When it is caused by the shape of the shoe we generally find the upper edge, or that part which comes in contact with the crust, to be hammered inwards, leaving the lower edge on the ground side wider than the hoof and projecting beyond it.

It is evident that horses which go very near must be more likely to strike the shoe against the other leg. Generally, when this defect exists in any considerable degree, the toes turn outwards, the heels approach

each other, and the inside quarter is much lower than the outside. Such a position naturally suggests the necessity of setting the feet more on a level by thickening the inside half of the shoe, and lowering the horn on the outside; but this remedy is not always to be depended on, and the want of success attending this method led Mr. Moorcroft to make some ingenious experiments to ascertain how far this plan succeeded in preventing the horse from cutting. This experiment, however, led him to adopt a contrary practice, viz. thickening the outside half of the shoe, and he argues, that "if the inside of the foot is raised and the outside lowered the supporting leg, when in action, will bring the body, and consequently the moving leg, more to the side of the supporting leg, and hence more liable to be struck. On the other hand, if the outside of the foot is raised,

the supporting leg will throw the body off that leg, consequently the moving leg will be farther off the supporting leg, and hence less liable to strike." The preceding remarks appear to me to be founded on good reasoning; but there are, however, cases which oppose considerable difficulty to every remedy that may be applied, and a variety of expedients have been resorted to besides those mentioned. Cutting off the inside heel of the shoe, and applying what is termed a three-quarter shoe has been used. Some leave the nails out, remove the crust, and hammer the edge of the shoe in, on that part which strikes the other leg, all of which are not effectual, and have often a tendency to do harm.

I have always observed that a plain shoe with the inside edge bevelled, or what smiths term feather-edged, when set on

even and smoothly rounded with the crust, to be the most efficacious, and sometimes to succeed where all other expedients have failed. When this fails, the only resource is to apply what is termed a cutting boot, to protect the part which is struck by the other leg, and the contrivance of a good one to answer the purpose has been extremely difficult. All those which have come within my observation have invariably produced as much mischief as they were intended to obviate. If the straps were buckled tight enough to prevent the boot turning round on the leg, swelling and inflammation were the consequences; and if they were not sufficiently tight, the boot was continually turning on the leg, producing much friction and irritation, besides being removed from the part it was intended to protect. As horses are often considered to be of little or no use that

have this defect, I determined on making some experiments to ascertain if it was possible to contrive a boot (see Plate VII. fig. 1.) that would answer the purpose without producing the disagreeable effects just mentioned.

An opportunity offered of a horse that strikes very forcibly the inside of the knees. I first took a cast in wax of the inner part of the knee, and from this cast iron blocks were made, in order to mould pieces of leather of the precise form of the limb, as I conceived that the boot, by fitting exactly, would be the less liable to turn or to irritate the leg. To prevent the boot from turning, I directed that the strap which buckles above the knee should be padded, so as to fit the depression on each side of the leg, leaving that part of the strap in the front and back part of the leg without

any stuffing. This prevented the boot from turning on the limb, but the galling and friction appeared to be by no means diminished. I tried various remedies to obviate this inconvenience, and almost despaired of being able to accomplish it, till it occurred to me to make the top of the defensive part of the boot moveable, without at all affecting the strap which goes round the leg. To effect this, I directed that a piece of thin leather, about an inch and a half in width, should unite the defending part to the strap; by this means, when the leg is in action, the thin piece of leather acts as a hinge, and there is a free motion between the defending part of the boot and strap, without any injurious interference. There should be also a strap at the bottom of the boot, buckling below on the outside of the knee, merely to prevent its turning up and getting out of its place.

And, to sustain more effectually a violent blow without injury, the inside of the boot should be padded, opposite to the part where the horse usually strikes.

Horses that have this defect to an extreme degree can work with such a boot with little or no inconvenience. It is necessary that the boot should be kept thoroughly clean, and oiled occasionally.

Fetlock boots will be found to answer perfectly well, if the straps that fasten them on the leg are padded on the same principle as the knee boot.

CHAP. XXXV.

ON WATER AND POULTICE BOOTS.

[See Plate VII. fig. 3.]

In cases of disease of the feet, where it is necessary to apply a poultice, or warm or cold water, there has been considerable difficulty to do it in an effectual way. If a poultice be required, the ordinary method is either a piece of sacking or an old rug or coarse cloth; the poultice is put in the middle, and the foot is set down on it, when all the sides are closed round the fetlock and tied with a cord or tape of any kind. When the foot has been bearing on it a few seconds, the poultice will be pressed from the bottom, where probably it is the most wanted, and from the loose texture of the cloth the poultice soon becomes cold, and

when necessary to renew it, the cloth is often cut through by the crust, and the greater part escapes. If warm or cold water be required, the common practice is either a stable pail, or a suitable tub made for the purpose; in the first place there is great difficulty, and in some cases great danger, attending an endeavour to teach horses to stand quiet in a tub. I have seen their legs cut badly by striking against the edge; but supposing a horse to be perfectly tractable, and that no difficulty of this kind presents itself, if he stands in water three or four hours it is in general considered a sufficient time; still, in order to complete that effectually, it must be at the expense of a servant being in sight of the horse all the time, as I have rarely seen any horse, however steady, but would steal his feet out of the tub, if unobserved. By this method, therefore, there are four hours of

moisture and twenty hours of evaporation. Now, surely, if moisture is useful, this is a very ineffectual way of obtaining it. Various expedients have been resorted to, at different times, to meet this inconvenience. I have, for the last twenty years, endeavoured by various experiments to overcome these obstacles, being satisfied of the great utility of moisture to the hoofs of horses. I have tried, and seen tried, boots of various forms and patterns, and a person a few years back obtained a patent for a sponge boot to answer that purpose, but all that have hitherto come within my observation have two insurmountable objections, which render them of little or no use. The first is pressure and friction on that part of the heel where the skin terminates and the hoof begins; it produces a separation between the two, similar to a deep overreach, frequently on the first ap-

plication, but never fails to do it eventually. The next inconvenience is produced either by the pad, which buckles round the fetlock, or the string which is used for that purpose. These create so much friction and galling, that after a few applications the inflammation in the skin of the hollow of the heel is so great, that they could no longer be used, and the manner in which the sponge boot is fastened round the fetlock, and having no iron defence below, renders them of little or no use.

However, after much trouble, I have suggested an expedient which obviates all those inconveniences and objections. On maturely considering the cause of the separation between the skin and the horn, I perceived that the leather or stiffened part of the boots was carried too high at the heels and quarters. I therefore conceived

that if that part were lowered as much as it would admit, so as to let the pliant part of the boot be opposed to the separating part of the heel, it might answer a better purpose. I also perceived that the friction and galling property in confining the boot round the fetlock existed principally in its having no adjusting principle; the boot top, I saw, was either too short or too long; if too short, pressure on the back part of the heel soon showed itself; if too long, on every movement of the foot there was so much play between the pad and the boot, that the skin of the heel soon suffered. I therefore considered, that if there were an adjusting principle to admit the tape which confines the boot top to be either higher or lower as required, that it might succeed, and my expectations have been realised.

These boots are made with leather bottoms defended by iron plating of different sizes; if required for the application of a poultice, a linen top made of drill is only necessary; but if required for the continued application either of warm or cold water, two or three thicknesses of Bath-coating sewed together, and cut of a proper form for the top, answers a far better purpose than any thing I have seen used. To maintain the whole foot in moisture, I direct a bottom (Plate VII. fig. 4.) of two or three pieces of this cloth sewed together of an exact size; therefore, when the top is soaked in water, as fluids descend by their own specific gravity, a considerable portion of the water finds its way to the bottom of the boot, where these doubles of cloth are ready to absorb it. The whole hoof is thus uniformly maintained in moisture. The only trouble with the use of these boots is,

to dip the foot with the boot on into a pail of water at the feeding hour, or as often as may be necessary, observing that it is also done at the last stable hour. It will be found moist the next morning: during the day it may be useful to remove all the litter, and to let the horse stand on the pitching. In this manner moisture may be used for any length of time, without any friction or galling of the heels or fetlocks. To preserve the sound texture of the frog, and the tough elastic property of the hoof, which continued moisture has a tendency to destroy, I appropriate two days in each week to stand without the water boots, for the purpose of applying the tar unguent on the whole surface of the foot, which I direct to be well rubbed in with the hand. This effectually saturates the horn, and obviates that crumbly propensity which continued moisture produces on the hoofs of

horses. On these days litter will be required, otherwise the hoofs would suffer by standing on the pitching, if uneven, without shoes.

It has been stated by some, that unguents will not penetrate into the horn of horses' feet; but let those who doubt it attend the forge, and examine those feet which are constantly stopped with the tar unguent, or indeed any unguent which has a distinct colour, and if the experiment is made on a white hoof they will have ample testimony of the depth to which unguents will penetrate. After the unguent has been used a little time, let a slice of the frog be taken off, cutting into the growing horn, give it a sharp bend, with the newly cut part outward, when, on inspecting the bent part, it will be plainly seen the unguent is oozing through the horn; this shows

that it is necessary to record facts from observation and not from imagination. I suspect that all the experiments, which have induced Veterinarians to state to the contrary, have been made on the dead hoof. In cases of inflammation of the feet, or where the horn of the hoof has been broken or mutilated, I have observed, that as much horn has been re-produced in one month, during a process of this kind, as if the horse had been turned out six months or more; and by this uniform application of moisture, and consequently an uniform abstraction of heat, it is probable that any remaining inflammation may be more effectually removed, than if the horse were turned out. In the ordinary practice of removing shoes in cases of lameness, and turning horses into a box without them, I have, on many occasions, observed a great devastation of horn by pawing and scraping the litter and

pitching; but on the application of a water boot which has a double of Bath-coating at the bottom, the crust remains entire without any injury; and where I see a propensity of this kind during the two days in each week appropriated to saturate the horn with tar unguent, I make use of a rope boot (see Plate VII. fig. 5.) which fits the bottom of the foot, and which prevents that mischief. Horses may be removed by a slow pace a considerable distance to a forge with either the water or rope boots on without inconvenience. If it is necessary to apply any unguent or stopping to the bottom of the foot instead of moisture, the poultice boot is equally useful. Tow, having been saturated with any thing which may be considered necessary, may be put into the bottom of the poultice boot, where it is retained on the foot with perfect security, and without inconvenience. As every thing

in the use of these boots depends on their being made agreeable to the principles and instructions I have given, I consider it necessary to remark, that I have noticed in several shops, very clumsy attempts at imitation, which are calculated from the reasons before advanced, to do much more injury than good. As the bottoms of these boots will last considerably longer than the tops, newtops may be readily put on the old bottoms. Those, who may be desirous of obtaining them agreeable to the principles I have stated, may be supplied with them either by Mr. Watson, wholesale bridle cutter, No. 5, Mercer-street, Long-acre, or by Mr. Long, veterinary surgeon's instrument maker, 217, Holborn. The cutting and fetlock boots may also be had of Mr. Watson.

CHAP. XXXVI.

ON SHOEING SMITHS.

I CONSIDER it necessary to make some observations on this class of useful men, to appreciate their individual merits, and to show that blame is too frequently imputed to them unjustly. Much has been, and is said about their obstinacy and prejudices, as being an insurmountable difficulty to any improvement in their art. I confess, that all my experience and knowledge of them is at variance with such an opinion. I have ever found them ready to adopt any plan which I have suggested; and it therefore may not be uninteresting to endeavour to show how such a prevailing notion has arisen.

When in the ordnance, the only difficulty I found with them originated in self-interest; they being required, for a stated allowance, to supply shoes and nails. This regulation induces them to make their shoes last as long as possible. To effect this, the foot is overloaded with iron, and instead of putting on a new shoe when necessary, a clumsy patch of steel is welded on the old one, and this is repeated again and again. On some occasions, when a horse has not been much used between the periods of shoeing, an old shoe will certainly answer all the purposes of a new one; but where a patch is put upon a patch form and principle cannot be very well accomplished.

If the smiths had nothing to do with the supply of iron and nails, in my opinion, this circumstance would not exist. This

was the only difficulty I ever found with them in the army.

In conducting either a public or private forge I never found the least difficulty in getting any instructions attended to, as to form or principle; but I have invariably found an eagerness to accomplish what I have suggested.

There is, however, a club established among them in the metropolis, which has an injurious tendency on their customs and habits, which unsettles and renders them servile agents to the purposes and views of this club, which breaks the tie and the bond of confidence which ought to exist between master and man, and is frequently productive of serious inconvenience to masters, to the public, and to the men themselves. They have established a fund

for the support of men in cases of sickness, age, infirmity, or being out of employ. The first part of their rules is very praiseworthy; but they have coupled with these rules, that no man who does not belong to their club, shall be employed by any master where club men are working. Should a master persist in doing it, all the club men are commanded by their rules and orders to strike, from which period, provided they cannot get a fresh master, the club contributes a certain sum weekly, until they meet with suitable employ. I have, on several occasions, seen fifteen or twenty men put on their coats and walk out of the forge when twenty or thirty horses were waiting to be shod, and the master compelled to shut up the forge, and obliged afterwards either to employ men who did not belong to the club, or to conform to their rules and orders. It would appear

an easy remedy to employ men who were not connected with the club, but the regulation is so general, that nearly all the best workmen belong to it.

Again, if the club consider their wages are not sufficient, either generally, or in any particular forge, a mandate is issued for the men to strike. Masters therefore cannot calculate on the services of a good man, nor can the man on a good master, if the club wills it otherwise.

I shall now offer some remarks on the master smiths, with whom self-interest, I have every reason to believe, will be found to be the cause of the various plans of shoeing that have been previously spoken of, and not any indisposition on the part of the men to oppose either one method or another.

Were it possible to suggest a plan by which a smith could put on more shoes in a day than by any we now know, I have no hesitation in saying, that it would meet with general adoption, except where proprietors of horses, or those deputed to the management of them, interpose and order it otherwise. Smiths of this description have so little knowledge of the structure of the foot, that a shoe is by them considered in no other view than as a defence, without any reference to the form producing any effect. If the nails clear the quick, and the horse moves sound out of the forge, that piece of iron which can be shaped and put on the soonest is adopted, if the smith be left to his own discretion; but on the other hand, he would be equally ready to comply with any other plan, provided he could get as much by it. It is, however, clear that if he be required

to bestow more time and labour in conforming to any other plan, his profits must be diminished, if not allowed to raise the price.

There is another considerable difficulty in adopting other methods than what are common, as it requires some practice in going from one method to another before it can be well accomplished. I therefore consider that all these difficulties are not attributable to any opposition on the part of the men, but to a defective state of the trade. As there has been no system of shoeing in this country which has shown its pre-eminence over others, every smith has been at liberty to adopt his own, and consequently he has followed that by which he could get the most money. This has been the cause of the rough and slovenly manner in executing their work, without

regard to form or principle, and of introducing men by no means competent to their trade. On the other hand, nad there been any specific plan before the public, which had shown a decided superiority, self-interest would have obliged smiths generally to make themselves acquainted with it, and a proper price would have soon found its level; but, as the case stands now, that forge, which charges the least price for shoes, for the most part finds most custom. But it is a matter of serious consideration with the proprietors of horses, to reflect on the evils and mischief such a practice introduces. It appears to me highly expedient that every man in this trade, on the expiration of his apprenticeship, should attend a suitable institution, and show examples of his workmanship, and afterwards undergo an examination of a competent board as to the rudiments of

his trade, before he is allowed to commence business for himself.

There is one circumstance in this trade which operates against any rapid progress towards improvement being made in it, which is, that a horse will go sound from the forge with any clumsy or ill-shaped piece of iron nailed to the foot, provided the nails clear the quick, and the sole is free from pressure, and if the very best shoe is put on it does no more; hence the indifference with which persons often consider these things, without reflecting on the consequences which may arise from the bad form of the shoe.

With an ingenious mechanic it is, however, otherwise; if a contrivance be presented to the public, where it is demonstrated that by adopting a new machine or

an improvement in an old one, for a less or the same expense, and that one horse's power is equal to two in any other way, the thing is so self-evident, that it only requires to be known to be in universal use. There are a number of very clever expert workmen in the metropolis, and in some of the principal towns, that would do justice to any system of shoeing, provided it was fairly before them, and the price they could charge was adequate to their time and labour. It is curious to hear the remarks of persons who affect to be judges of this trade; some will say, give me plenty of cover, let me have iron and room enough, do not let me have any of your slippers. Others will say, do not let me have any of your clumsy heavy shoes, let them be narrow and light; and a variety of other absurd observations, when, probably, the horse where cover and iron is

wanted, may have a hoof abounding with horn, and would nearly go without shoes; and others where a narrow light shoe is wanted, probably have a thin flat foot, which requires defence and cover. I have mentioned these circumstances to show that a correct knowledge of this art is not to be obtained by occasionally taking up horses' feet, or looking at shoes and nails; it can only be acquired by an unceasing attention to the forge, either in practice or for observation. It would be desirable if men in this trade, like many others, were paid in proportion to their ability; but that is not so much attended to as it should be.

There are two classes of journeymen, fire and door men. The fireman forges and fits the shoes to the feet, and the doorman assists in forging, and nails the shoes on when fitted. There are regulated prices

for these two classes, without any regard to ability, and it is not unusual to see a bungler at his trade get as much as a clever man.

In the construction of forges much might be done towards their improvement, as all those I have yet seen are very defective in arrangement and convenience.

Sets or single specimens of the different examples referred to in this work, may be had of Mr. Dudley, Bronze Manufacturer, 36, King-street, Soho; or of Mr. Long, veterinary surgeons' instrument maker, 217, High Holborn, in cases containing bronzed models of the foot, with or without shoes on.

They may also be had in shoes of cast iron patterns.

Likewise may be had of Mr. Long, the ball probang, for giving balls without the necessity of introducing the hand and arm into the horse's mouth. For this invention the Society for the encouragement of Arts, &c. &c., conferred upon Mr. Goodwin their silver medal. See the 34th Volume of their Transactions.

POSTSCRIPT.

The author omitted in the chapter on grass shoes or tips, page 210, to mention that an attempt was made to bring them into general use for road-work and other purposes, but, as they were found not to answer, the practice was soon discontinued.

At page 175, the author stated that the proper time for shoes to remain on the feet of horses is from three to four weeks, but he omitted to mention the absolute necessity for taking them off within that time, whether they be worn out or not,

for the purpose of removing all superfluous horn, and to preserve the hoof in its proper form and size. If this practice be not regularly attended to, and the shoes from any circumstance are allowed to be on many months, (and such cases have occurred,) the feet become distorted in every possible way, and the most ruinous diseases ensue.

Since the description of the removable ruff (page 236) was printed, the author has devised a more simple method, which more effectually answers that important purpose. In the centre of the permanent ruff, which is made with and is part of the shoe, a counter-sink hole is punched, and a corresponding hole in the steel movable ruff; through these holes a rivet is passed and fastened. An oblong hole is also punched through the centre of the shoe close to the

permanent ruff, to receive a corresponding pin from the bottom of the movable ruff. When this ruff is worn down to a quarter of an inch, it should be taken out, which is easily done, by applying a few strokes of a file to the head of the rivet, and a fresh one applied as above directed, by which means the shoe is not at all disturbed or misplaced.

These steel movable ruffs should not be quenched at a red heat, as they would then be liable to break in wear, but at a blue or spring heat.

The author advises that the permanent ruff on the shoe, as well as the movable steel ruffs and iron rivets should all be manufactured in tools, as the parts will then all correspond, and there will be no

doubt of their fitting and being easily adjusted.

The author is of opinion that this important, though simple invention will be of great advantage in all cavalry regiments, and he ventures to recommend, that always on the commencement of winter, the horses should be shod with permanent ruffs as here described, and that a blunt moveable ruff should be used to prevent the rivet holes being injured, till the weather makes the frost ruff necessary. In the meantime, a sufficient quantity of the movable steel ruffs and iron rivets should be prepared for immediate use as well as for future supply, and every soldier be instructed in the very simple operation of putting them on and taking them off. Thus any body of cavalry may, in one hour, and without the aid of a smith, be

prepared for service in the most severe frost, and be in constant readiness, however long its continuance, if every soldier is supplied with a quantity of the ruffs and rivets, the weight of a hundred of which is a mere trifle.

THE END.

LIST OF PLATES.

PLATE I.

Fig. 1. — Represents part of a fore-leg, with a side view of the foot, shod on the author's system.

a. — Shows the shoe on a straight line from the heel to the point of curve, and also the degree of curve at the toe.

b, &c. — The parts where the nerve operation is usually performed.

Fig. 2. — A side view of the coffin bone.

a. — Shows the degree of curve at the toe, in the natural bone, and harmonising with the French method of shoeing.

PLATE II.

Fig. 1. — Common English shoe, the ground side.
Fig. 2. — Ditto Ditto the foot side.
Fig. 3. — Seated shoe, Ditto.
Fig. 4. — Mr. Coleman's shoe, the ground side.

Fig. 5. — Hunting shoe, the ground side.

Fig. 6. — Mr. Bracy Clark's shoe, with a joint at the toe.

a, *b*, *d*, *e*, *f*. — Showing a straight line from heel to toe.

c. — A deviation from the straight line, and showing the degree of curve at the toe.

PLATE III.

Fig. 1. — Patten shoe.

Fig. 2. — Screw shoe.

Fig. 3. — Bar shoe, the foot side, with the bar raised.

Fig. 4. — Plain bar shoe, the foot side.

Fig. 5. — Road shoe, with moveable toe-pieces.

Fig. 6. — Frost shoe, with moveable ruffs.

a, *a*, *a*. — Degree of curve at the toe.

PLATE IV.

Fig. 1. — Grass shoe.

Fig. 2. — Racing plate.

Fig. 3. — The author's hind-foot shoe, ground side.

Fig. 4. — An improved parallel fore-foot shoe, ground side.

Fig. 5. — German horse nail.

Fig. 6. — English counter-sunk horse nail.

Fig. 7. — Common English horse nail.

Fig. 8. — French horse nail.

PLATE V.

Fig. 1. — Moorish shoe.
Fig. 2. — Persian shoe.
Fig. 3. — Ditto nail.
Fig. 4. — Portuguese shoe.
Fig. 5. — German shoe.
Fig. 6. — French shoe, foot side.
Fig. 7. — Ditto Ditto, ground side.
Fig. 8. — Ditto nail hole.

PLATE VI.

Fig. 1. — The butteris.
Fig. 2. — Large drawing knife, used for the sole.
Fig. 3. — Smaller Ditto, Ditto frog, &c.
Fig. 4. — Small Ditto, Ditto searching.
Fig. 5. — Common turning hammer.
Fig. 6. — Improved ditto.

PLATE VII.

Fig. 1. — Speedy cut boot.
Fig. 2. — Swab.
Fig. 3. — Water boot.
Fig. 4. — Bottom for water boot.
Fig. 5. — Rope boot.

PLATE VIII.

Fig. 1. — Natural hoof.

a. — French method of driving the nails within the crust, and going through a portion of the sole.

Fig. 2. — Contracted hoof.

Fig. 3. — Convex sole, or pumiced hoof.

Fig. 4. — Flat thin hoof, with weak low heels.

Fig. 5. — Natural coffin bone.

Fig. 6. — Coffin bone after some years shoeing.

PLATE IX.

Fig. 1. — The author's shoe, the ground side.

Fig. 2. — Ditto Ditto, the foot side.

Fig. 3. — French horse nail.

Fig. 4. — Straight line from the heel to the point of curve at the toe, with the degree of curve.

PLATE X.

Fig. 1. — The cast of a foot, taken April, 1819.

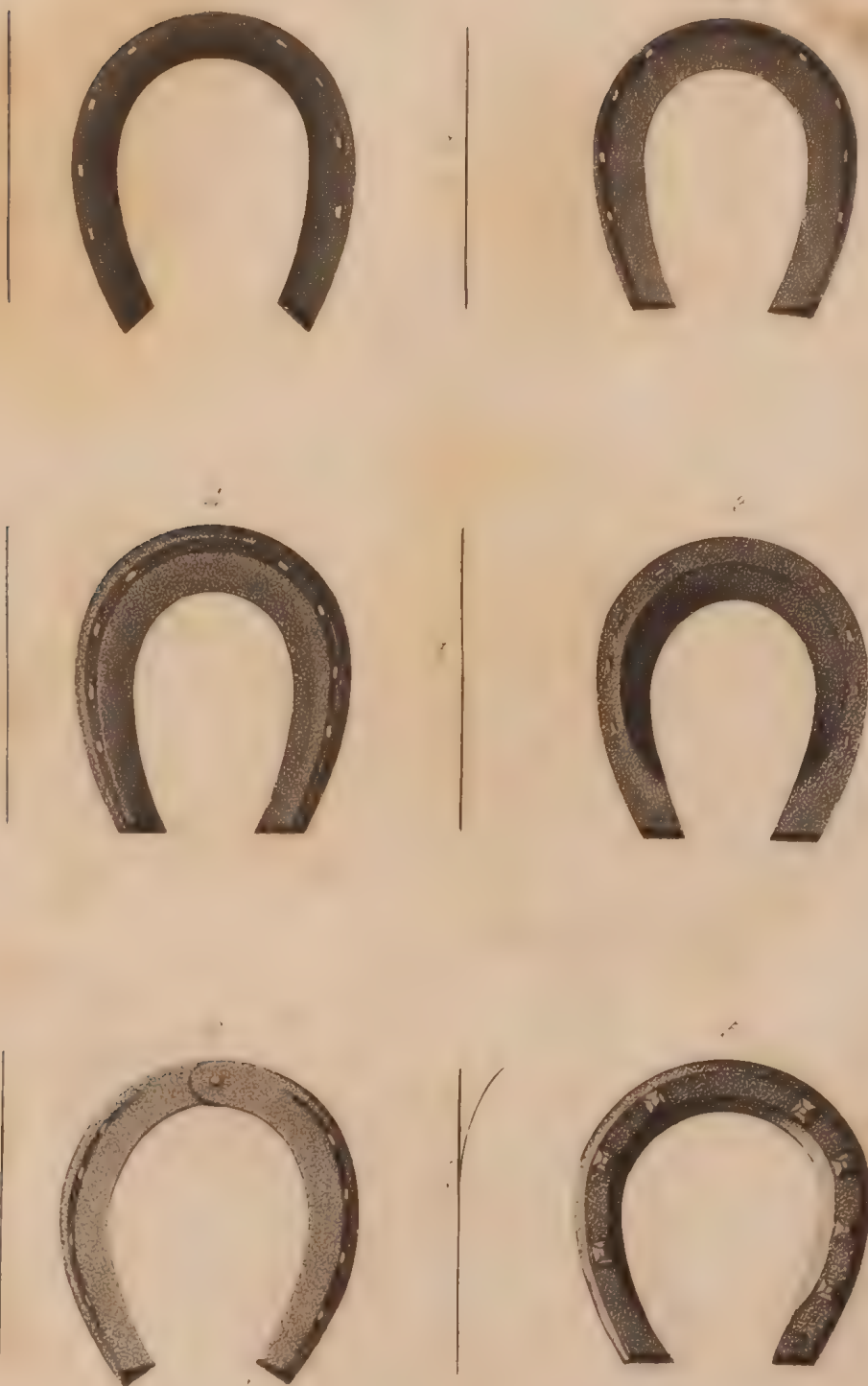
Fig. 2. — A cast of the same foot, taken October, 1819.

The binder is requested to place all the Plates, (except the first, which is to front the title-page,) at the end of the book.

Printed by Strahan and Spottiswoode,
Printers-Street, London.

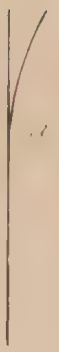
Published by Longman, Hurst, Rees, Orme, & Brown, 1819.

Fig. 1



by Longman, Hurst, Rees, Orme, & Brown, 1819

Fig. 1.



(c) Longman, Hurst, Rees, Orme, & Brown.

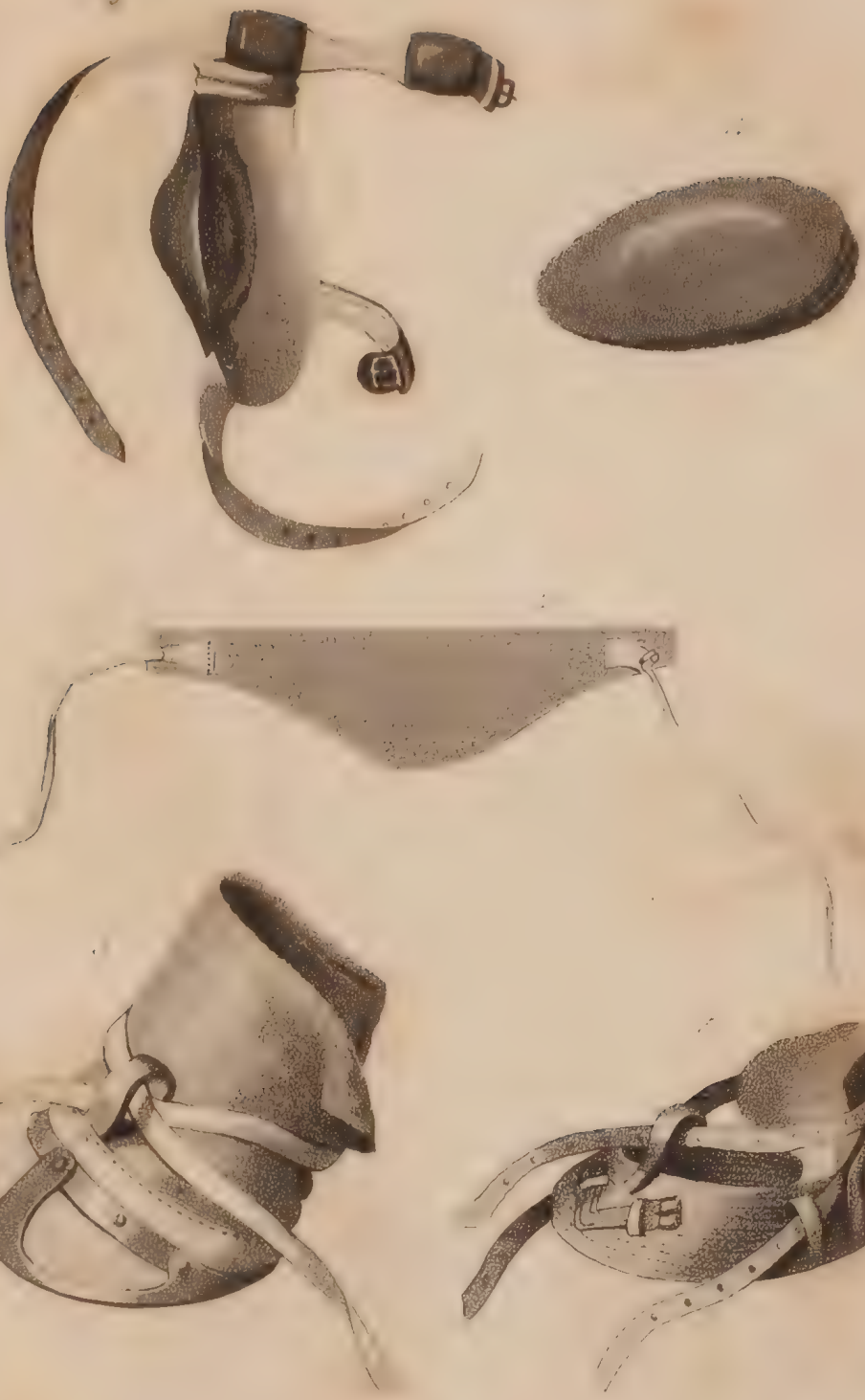
Fig. 1

Published by Longman, Hurst, Rees, Orme, & Brown, 1810

Published by Longman, Hurst, Rees, Orme, & Brown, 1819.

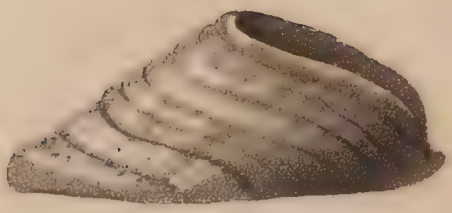
Published by Longman, Hurst, Rees, Orme, & Brown, 1819.

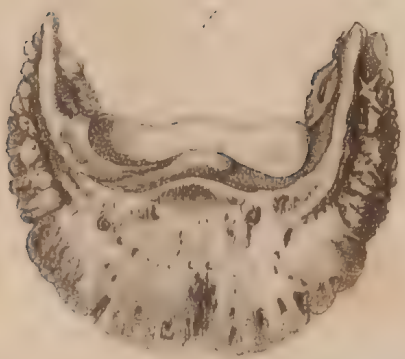
Fig 1



Published by Longman Hurst, Rees, Orme, & Brown, 1811

4





Published by Longman, Hurst, Rees, Orme, & Brown, 1819.

Published by J. Norman, Ha[illegible]

Fig 1